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EDITORIAL :—SOME HIGH LIGHTS

The General Economic Scene :

The impact on the economy of the war forced on the country depends on (a) the war aims, (b) the length of the war, and (c) the international reactions to the Country's involvement in the war. On all three issues, the initial developments during the fortnight of hostilities need analysis. The first war aim was established in the recognition of Bangla Desh and the consequent assumption of responsibility by the Country for the rehabilitation of Bangla Desh and its 75 million people. The care of the nine million refugees has involved the Government in a daily expenditure of around Rs. 2 crores. Todate the Lok Sabha has voted Rs. 350 crores for care of the refugees. The rehabilitation of the devastated country and its infrastructure would call for about three times those resources. Bangla Desh has a viable economy, earning Rs. 140 crores in foreign exchange and exporting to West Pakistan Rs. 90 crores annually. Its 34 million acres of cultivable area produces rice, jute, and tea at rather low levels, as the new technology has not reached the cultivator. Apart from the jute industry, the State has a flourishing sugar, fertiliser, cement and paper industry. A start has been made in refinery, machine tools, cables and on iron and steel plants. Thus the new State has a sound economic base and a good potential refrastructure. There is urgent need for reconstruction first of the infrastructure which has been seriously damaged and destroyed and for development of its large agricultural potential and industrial beginning. For this there will have to be a massive injection of rehabilitation and development capital mainly from India. The Indian economy and fiscal system must be restructured to carry out this responsibility. The tax effort that has been made by the Union and State Governments in the way of the surcharges on imports and some exports, corporate income, air and rail fares, registration fees and postal rates and the State levies on entertainment, road transport and urban property together with the planned reductions in non-developmental and non-planned expentures at all levels, in order to raise the resources to care for the refugees will have to be increased very considerably. The total additional Central tax revenue for this year will be Rs. 377 crores plus Rs. 150 crores due to better receipts and Rs. 100 crores in defence bonds. As of December, deficit financing stands at Rs. 340 crores against the Rs. 233 crores estimate for the whole year. Tamil Nadu has also imposed additional taxes on entertainment in various forms and road transport amounting to Rs. 2 crores. It has pledged an initial contribution of Rs. 10 crores to the Defence Fund. The rehabilitation of Bangla Desh will involve a further increase in taxes and some cut in the plan expenditure for the last two years of the Fourth Plan. This reduction will have to be carefully worked out in order to ensure an increasing total output both of capital and consumption goods which India will have now to share with Bangla Desh.

The length of the hostilities and the cease fire have a direct effect on the economy. The current shortages in industrial raw materials, notably steel and cotton must be immediately corrected through cooperative action by management and labour on a planned programme of capacity utilisation of the country's steel plants and the rapid, if necessary subsidised production, of surin and other improved varieties of cotton. The defence

demands on steel, machinery, chemicals, cloth, petrol, kerosene, paper, wheat, rice, pulses and sugar are mounting fast and there is need both for increased production in all these commodities and a distribution policy which will meet the increased military demand and ensure adequate availability of the wage goods to the working and poor majority in the country. The State Government has already established policy and instruments for increased production in some lines and against speculative hoarding of foods and rise in consumer prices. The plan to establish cooperative paper factories using canaph in each district, starting with Tirunelveli and Chingleput, will increase paper supply rapidly. Forty tonnes per acre of the raw material from canaph will be available within five months. Punitive action against hoarding is under way. In one State 450 traders were arrested on December 7 for hoarding Rs. 20 lakhs worth of foods, which includes 12 trucks, 1,961 quintals of rice, 92,000 kg. of mustard oil, 24,700 litres of kerosene and 7,400 batteries. Even more important are the State Government's measures to streamline the functioning and administration of consumer cooperatives and the starting of the Southern Consumers Union in Madras in mid-November as part of the Indian consumers Union inaugurated in Delhi a week later, as a means of people's resistance to price rises and to malpractices through adulteration and low quality of consumption goods. In addition the Union government has under consideration proposals to introduce physical controls of some essential commodities such as food grains, kerosene, coarse cloth, edible oils and sugar. At the out break of the war, Bombay reported that consumer prices for kerosene, paper, torches, lanterns, candles, matches and sugar have been raised by retailers from 20 to 100 per cent —though the supply position on all these items is quite sufficient to meet all the requirements. Kerala reports that prices of rice and sugar have shot up while the export products, coffee and coconut oil, prices have declined. The case of sugar is urgent. From the decontrol price of Rs. 1.85 per kilo, it increased to Rs. 2.05 per kilo at the beginning of November and was selling at Rs. 2.30-2.50 per kilo at the beginning of December in the city. This 25 per cent price increase in an essential commodity is due to speculative hoarding, unplanned policies of government stocks and releases and uncertainty about the excise duty. The State Government has proposed reimposition of sugar controls and has made available sugar in the State at Rs. 2/- per kilo through cooperatives and fair price shops. The State Government's proposal that inter-state movement of essential commodities like rice, pulses and oils should be controlled by the State Government is also a means of holding the price line. The Union Government's further proposal to restrict bank credit for speculative trading and hoarding activities and the Reserve Bank's directive that borrowings by the commercial banks at the end of the current financial year should be the same Rs. 191 crores as in April 1971 are further moves in containing the inflationary pressures on the economy. This objective should be pursued with a generous refinance policy for large industry, export activities as well as the priority sectors of small farmers and small industrialists. The decision of the Reserve Bank to provide generous credit to textile mills and trade should be followed up by IFC aid to textiles and similar lifting of credit curbs to large industry. These many proposals and directives now need to be woven into a clear and effective programme, given the effects of the war and the truce period on the economy.

The third component of the effect of the war on the economy will depend on international reactions to the Country's war effort, particularly on the international economic relations between India and the other countries—both developed and developing. Already three of the major partners in India's economic effort, the United States of America, Japan

and Federal Republic of Germany have decided to terminate their economic and financial aid to the country-which are mainly in the form of long term low interest loans. Apart from aid from the Soviet Union and the Socialist Countries, the Aid India Consortium of the Western countries had pledged a sum of Rs. 802 crores for 1971-72. Out of this total about one third, Rs. 291 crores has been subject to detailed negotiations and agreements between India and the cooperating country. About half this signed aid, Rs. 142 crores, is in the form of non-project loans from the United States. The United States decision to cut off further aid refers to Rs. 65.7 crores, out of this sum of Rs. 142 crores and concern mainly fertilisers, industrial raw materials and transport aircraft. The Indian Farmers Fertilizers Cooperative project in Gujarat which was to be jointly aided by the U.S. (Rs. 15.75 crores) and U.K. (Rs. 12.25 crores) will now have to go ahead without the U.S. part. The Smelter plant for Indian Aluminium (Rs. 82 lakhs), the textile plant on synthetic fibres (Rs. 1.46 crores), air-craft purchases (Rs. 12 crores) and the Ramagundam and Dhuvaram Thermal Station and the Tarapur Nuclear Power Research Station will also be affected. The more serious strain on the economy will be the reduction in steel imports, spare parts and components that the United States cut imposes. The country will now have to develop its industrial raw material production at a faster rate. This reinforces the need for full capacity production of all our capital goods and metals industry that has been referred to earlier. It may also call for some reordering of the Fourth Plan priorities. The other two countries which have decided to suspend their economic cooperation with India are the Federal Republic of Germany and Japan. Here it is too early to assess the precise effects on the economy of this decision. Once again industrial raw materials including steel and components are likely to be the main items which the country will be losing. Japan's aid of Rs. 30 crores for Vishakpatnam outer harbour and Bailadila Iron ore deposit No. 5 will be cut. This is part of the eleventh yen credit which is now suspended and which cuts off 105 million dollars of project aid plus 20 million dollars for purchase of iron steel products which were being negotiated. In the case of Germany, the agreement for centrifugal nuclear technology will be affected. For Tamil Nadu the decision of the United States, Germany and Japanese Government is particularly unfortunate as the Tuticorin fertiliser complex and some 8 to 10 new industrial plants (referred to in the October issue of the Bulletin Vol. 1. No. 9) mainly in the chemical and dye fields planned after the last visit of the Minister of Industries to these countries will now have to find other sources of inputs for their establishment. The German agreement to establish at the Indian Institute of Technology, a modern computor centre for the southern region may also be affected. The total net aid from all sources to India amounts to 2 per cent of the total Union and State expenditure. If private capital flows are taken into account, the total financial flows constitute 7 percent of the country's aggregate investment. One of the major functions of aid is to compensate the heavy repayment of the country's external debt—capital repayment and interest—which amount to over 600 million dollars a year. This is about 30 per cent of the country's export income and constitutes over 50 per cent of the gross external aid. Aid suspension could thus have an immediate impact on the whole question of the country's repayment obligations.

The targets and pledges of the Second Development Decade take on for this country and the State added urgency. Our record in the sixties was dismal. The World Bank Atlas for 1971 reminds us that our population and average annual population growth rate during 1961-69 placed us among the first group of countries. Our per capita GNP and

average annual growth rate of GNP placed us in the seventh last group of countries, sharing this position with Cambodia, Central African Republic, South Yemen, Uganda, Indonesia, Laos, Madagascar, Pakistan, Sudan and Togo. The World Bank's computation is that our GNP is $ 100 and growth rate for 1961-69 was an annual average of 1 per cent. Our official computation is Rs. 524 per capita and an average growth rate of 0.6 per cent.

The forecast by the Economic Times Research bureau is that for 1971-72 the GNP growth rate is likely to be 4 to 5 per cent, compared to 6 per cent in 1970-71. This sombre forecast is based on a 3-4 per cent agricultural growth for the current year against the 5 per cent for 1970-71, primarily due to the serious effects of floods and typhoon in Uttar Pradesh, Bihar and Orissa and the drought in parts of Maharashtra, Mysore and Andhra Pradesh. The normal annual cost of these factors have been Rs. 30-40 crores but for 1971 exceed Rs. 250 crores. Similarly industrial growth for the current year is estimated at 4-5 per cent, to which is added a 6-7 per cent forecast for the tertiary sector. This forecast is, however, overly pessimistic and is based on an under-valuation of the basic forces in the economy. The current season is witnessing bumper harvests and sizable, large stocks amounting to 7.5 million tonnes of food grains are being held by the Food Corporation of India and the State agencies. Cotton production is expected to be nearly 60 lakh tonnes against 47 lakh tonnes last year. So too has the oilseeds crop registered increases. The wheat target of 2 million tonnes for the Fourth Plan is already reached in the third year. 11 lakhs tonnes of rice have been produced last month and this month. There is no reason to believe that despite the adverse factors just referred to, the agricultural growth will be less than last year's 5 per cent. The news of the industrial front is also encouraging. Under the impetus of the emergency, there are indications that the annual rate of production of steel in the public and private sectors may work out to 80 per cent of capacity. The Hindustan Steels' November production of hot metal, ingots and saleable steel showed an increase of 20 per cent over October. Provided there is a regular input of iron ore, ferro manganese and limestone and adequate turn around and scheduling of wagons, steel production for 1972 should increase by 10 lakh tonnes. Steel ingots alone can be increased by one lakh tonnes. This would compensate the reduction in steel imports consequent on the aid suspension. On top of this are the regulatory excise duties which will reduce domestic demand for ferrous and non-ferrous metals and encourage greater use of aluminium. There is also a spurt in the production of soda ash. Tata Chemicals reports a record daily output of 818 tonnes, with plans for increasing its capacity to 1000 tonnes. The aid suspension as it affects the Gujarat and Tuticorin fertiliser projects will involve reconsideration of the Tata Fertiliser Project, involving the production of Urea and other nitrogenous fertilisers and phosphoric acid. The emergency has also brought about a much needed respite in industrial disputes as in the Simpson and Addison groups in Madras, Raymond Woolens, Chemicals and Fibres and Castle Mills in Bombay. Management and labour co-operation is also beginning in the key industrial belt of West-Bengal and the trade unions are taking the lead in promoting industrial peace and increased production. Thus the Country and the State are now well on the way to make the special effort called for by the Emergency and the Second Development Decade target. The Decade's target of 6 per cent Gross National Product growth will have to be surpassed by India to meet its own development demands by the poor majority of its people, the demands of the Emergency and the rehabilitation demands of Bangla Desh.

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Agricultural situation :

Paddy Production : The favourable paddy production estimates for the State (see Vol. I No. 10 and No. 11 issues of the Bulletin) are being realised. The kuruvai harvest due to the co-ordinated efforts of the farmers and the agricultural department is satisfactory. In the Thanjavur district, the good weather particularly during the harvest has resulted in a two tonnes per acre yield of karuna, which has been grown over one-third of Kuruvai. Only in two pockets, Kumbakonam and Mayuram, has there been a decline in quality and per acre yield due to pests. For the district as a whole the 7.50 lakh acres of Samba paddy and 4 lakh acres of Thaladi have yielded over 12 lakh tonnes. This good harvest is a little too much dependent on the fortunate coincidence of a dry spell at the time of harvesting. Last year due to the 10 day rain in early November which is the harvesting season, the quality of paddy was seriously affected, and the moisture level of the Food Corporation of India purchases had to be very high in order to avoid heavy losses to farmers. The popularisation of dwarf varieties meets in part this problem of harvest rain. But even those varieties face the danger of grain germination in the earhead when there is a heavy rain. And so the technique of inducing dormancy in the earhead during this crucial 20 to 25 days through foliar spray of mallic hydrazide developed by the Tamil Nadu Agricultural University should now be widely applied in the paddy belt to avert this loss to the farmer. The grain is unaffected by the spray and after the three week period of dormancy, germinates quite normally. Incidentally the same technique, which costs only Rs. 20 per acre, can be applied to meet similar problems faced in potato, onions, sugar-beet and gronndnut crops.

Fertilizer application : Another production problem that has been resolved is the establishment of optimum fertilizer applications to paddy and other food crops. Too much or too little application of fertilizers reduces the yield. The nitrogen phosphorus and zinc applications for the rice plant (IR-8, Padma, Jaya) have now been standardized through intensive research. The Bangalore Workshop at which these important results were established also found from three wide ranging experimental programmes that double cropping produces ten tonnes of grain per hectare and three crops fifteen tonnes per hectare. Perhaps the most important finding is that phosphorous application is needed to ensure nitrogen assimilation in dry farming. If accompanied by moisture conservation measures, this finding may revolutionize the crop yield in the various grams, groundnut, castor and soya-beans for the dry farmer. The State's agricultural policy aiming at increased output and stable production and its instruments to meet the under-nourishment of the State's poor majority and malnutrition of infants and lactating mothers can now be effectively put into effect. Increased production both of cereals and protein are now realisable targets.

Marketing : A problem concomitant with this expansion in rice and other food grains production is the marketing of the increased crop. The Food Corporation of India is the major purchaser. It has been authorised by the State Government to collect the 25 per cent levy on the purchase and movement of paddy. Its purchasing policy is the subject of controversy in the paddy producing areas. The millers and dealers are critical of the Corporation's purchasing directly from the farmers. On the whole the evidence from the farmers and producers is in favour of the price stabilising and marketing action of the Corporation. The problem however is wider and relates to the urgency of

developing markets to keep pace with production expansion. In this regard, the National Agricultural Co-operative Marketing Society is planning to establish 130 regional pilot centres consisting of well run primary marketing societies and 520 associate centres. Each pilot centre will extend its development and promotional programme to neighbouring primary societies annually and develop them into associate centres. The State Government on its side has allocated Rs. 1.5 crores for a three-year programme of developing a marketing net-work in the rice bowl of the State, the Cauvery delta covering the districts of Tiruchirapalli, Thanjavur and South Arcot. In Thanjavur where the major investment is being made, a market complex and a good road network to facilitate inward movement of inputs and outward transport of the crops are being developed. In Tiruchirapalli, the market complex is being developed in the Lalgudi taluk and a road network in Karambakudi, Thottiam, Musiri, Karur and other important agricultural areas. The market development programme needs to be further extended and for this the growing surplus income of the large farmers should and can be mobilised to supplement Government financing. The income earning pattern of the middle and large farmer is such that he has the motivation in developing regulated and organised markets. He is not forced into distress sales and the middle man is no longer a market substitute for him.

High Yielding Variety : High Yielding varieties are being standardised for a wide range of crops in the State. The Kovilpatti Station has now released a new cotton strain —Karunganni-8-with the highest mean fibre length of 1.08 inches and capable of being spun upto 40 counts of yarn. If grown over the existing dry cotton tract in the State of 2.25 lakh hectares, it will increase cotton production by 26,000 bales—a much needed break-through at this time of strain in the Emergency economy. A new variety of sunflower seed—K.1 has also been released for use in dry and irrigated areas, yielding 6 and 20 quintals per hectare respectively, corresponding to 3 kg. and 14 kg. of oil production. Its production duration is 85 days. The Salem Castor Research Station has also released a new castor variety—SA-2, which increases yield by 3 per cent over its predecessor SA-1. It has an oil content of 52.2 percent and yields upto 1,000 kg. per hectare. It gives a per day oil production of 3.5 kg. compared to kg. from SA.1. Its net return is upto Rs. 1,000/- per acre. More important, it is a dry crop of short duration of little over three months. It can be mixed with dry cotton in Tirunelveli and Ramanathapuram or can follow the rice harvest as a crop in rice follow in other districts, and can grow as a single crop in the dry farming areas of Palladam, Dharmapuri, Udumalpet and Salem.

Pests : The State is also facing a pest menace. A mango pest—the parasa lipida—is active in the State's mango plants particularly in Saidapet and Chingleput. In the Nilgiris, the potato pest, the golden-worm, has been attacking the potato plant roots and is in danger of spreading over a much wider area. The tobacco pest is also once more active. In all these cases, the current pest control programme in the State needs to be supported by an intensified programme of pest control research. For export crops, tobacco, tea, coffee, cardomom and fruits, the nature of chemicals used must be related to the quality demands and standards of the export market.

In connection with the pesticide programme, the State Government has set a target of 14 lakh acres for aerial pesticide spraying including 8.8 lakh acres under paddy crops. In November, paddy spraying in Saidapet and Chingleput districts and in December 4.5 lakh acres groundnut and 2 lakh acres of cotton crop have been completed. To extend

this much needed programme, the Tamil Nadu Agro-Industries Corporation is acquiring five helicoptors for hiring to Panchayat unions for aerial spraying of pesticides. This programme too must be supported by a long range programme of studies into the effects of the use of pesticides.

Water : Water use is once more claiming State attention. The large programme for construction of wells, energising pumpsets and increasing piped water supply to rural areas in which the World Bank and UNICEF are co-operating have been referred to in previous issues of the Bulletin (Vol. I Nos. 9 and 10). The State Groundwater Project at a cost of Rs. 26.25 crores involves the provision of 7,000 filter points, 4,000 pumpsets and 90 medium tube-wells in Thanjavur district. The survey has been completed there in December. In a second phase 400 tube-wells in Tiruchirapalli and 3,000 in South Arcot are to be constructed next year. The last phase is well under construction in Salem, Dharmapuri, North Arcot and Chingleput districts. The State Water Supply and Drainage Board has also initiated its programme for constructing 8,850 tube-wells for drinking water in scarcity and cholera affected villages, starting in Coimbatore and Salem. This programme will cost Rs. 2.71 crores and cover 1,800 villages in 11 districts. The proposal to construct the bedregulator across the Cauvery near the Upper Anicut in the Tiruchirapalli district is a water programme that can both control floods and provide Lalgudi and other water starved areas in the Tiruchirapalli district the needed water through an economical use of existing resources. Further the use of water for farming sandy areas is under active study and demonstration both by the Government and enterprising farmers. Drip and trickle irrigation which drips and spaces water to the precise amount required by each crop, the storing of water in sandy areas and splash watering, along with adequate and correct fertilizer application are being experimented at various stations in the State. Now the time has come for the State to set up a water policy instrument. The State has harnessed all its rivers and water resources for irrigation and river and ground water exploitation is being planned and executed on an extensive scale. Such a Tamil Nadu Water Board should address itself first to the problems of use of groundwater, co-ordinate the plans and programmes of all the State bodies dealing with water and recommend the spacing of wells on the basis of a log of the State's ground water potential. The agency could also ensure proper maintenance and use of wells and well water. Such a broad programme should be tied in with the State programme of land reform and co-operation.

Credit : The production perspectives, fertilizer application, marketing, land and water use are all dependent on the availability of credit to the farmer. Evidence is mounting in the State that the credit needs of the small farmer are not being met by the institutions set up for this purpose—the co-operatives and commercial banks (See Vol I. No. 7 of Bulletin). The major need now is for the credit to reach the small farmer in kind and in time. In the Thanjavur district, as in the State generally, the land ceiling legislation has been generally and successfully evaded through benami land gifts and transfers. The district officers reported to me that one land-lord who had 10,000 acres, was able to produce necessary documents and hand over 24 acres to the Government as being in excess of the 30 and 15 acre ceiling. Of the 40,000 acres in the Thanjavur district assigned to the landless, over 30,000 acres are Government poramboke land which had already been encroached upon and occupied and the remaining, obtained from the ceiling legislation, was assigned at a nominal price. But even this land distribution programme is in danger because the assignees are not obtaining from the co-operatives and commer-

cial banks loans for fertilizer and manure application and development of adequate drainage. Co-operative credit goes readily to the large landholders and the small farmer is in the position of not being able to use the land assigned to him. As for the drainage problem, its seriousness is seen in the decision of the assignees to return the land to the Government, if the drainage system is not improved. The lands assigned in 1969 in Serukolathur in Mannargudi taluk have not yet come under cultivation. Thus the proposals made by the Planning Commission, the Reserve Bank of India and the National Commission on Agriculture coincide in meeting this credit bottleneck. The main features of these proposals are : Credit is to be provided by the co-operatives and commercial banks in the form of fertilizers, pesticides, seeds and other inputs to the small farmer ; the small farmer and land reform areas are to be both priority credit areas and those where integrated land development programmes based on scientific farming are to be launched : the transport margin and handling and storage charges for fertilizers distributed by the co-operatives are to be increased and the streamlining of distribution arrangements are to be effected : (the Madras Fertilizers marketing pact with co-operatives for distribution is a move in this direction): procedures for financial assistance for installing pumpsets, digging wells, purchasing tractors are to be simplified so that the facilities reach the small farmer at the time he needs them—before and during the ploughing and growing season. Apart from the demand of the Emergency, these agricultural credit stimulation measures are part of the package on which the small farmers' living depends and must be put into effect without delay.

In connection with the worrisome problem of rate of arrears and overdues in co-operative lending, the following statement given to me by the Executive Officer of the Co-operative Central Bank, Kumbakonam in the Thanjavur district is enlightening and might have wider lessons for the State. The recovery rate there runs at between 93 to 98 per cent.

Table

The details of agricultural loans advanced by the Co-operative Central Bank, Kumbakonam during the last three years and collection & demand under all loans are set forth below :

Issue of agricultural loans :

	(Rupees in lakhs)
1968-69	145.54
1969-70	209.64
1970-71	250.27
1971-72 (upto 30-11-1971)	348.52

Collection of Loans :

(Rupees in Lakhs)

	Demand	*Collection*	*Balance*	*Percentage*
1968-69	191.04	178.65	12.39	6.48
1969-70	244.74	237.44	7.30	2.98
1970-71	319.76	310.84	8.92	2.41

Plantations: A similar renovation with the help of resources to be made available by the Agricultural Refinance Corporation is needed in the State's plantation crops. The most urgent area in need of such renewal is tea where nearly 33⅓ per cent of bushes in tea plantations are over 50 years old. The rubber estates and their viability and the coffee and cashew plantations need similar renovation and planning. The Reserve Bank Governor emphasises the key importance of plantation crops in the external trade of the country. Using only half-a-percent of our total cultivated area, tea and coffee earn 11 per cent of our total foreign exchange. On the other hand cashew production has got to be planned and developed as a plantation crop and till then the illusion that it earns Rs. 52 crores in foreign exchange must be corrected by the Rs. 30 crores of imports of cashew on which the export is based. What is now needed are plans for replanning the crop plantation with the help of the Agricultural Refinance Corporation and the extension of the coverage of the credit guarantee scheme to the small coffee, tea and rubber industries and factories.

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Industrial pointers:

Boilers: The Tiruchirapalli Heavy Pressure Boiler Plant is working to full capacity and is one of the few public sector plants to surpass its target. Against the target of 3 types, it is producing 60 boilers of 17 types. Its export orders are rapidly expanding. The 1970 Rs. 2.25 crores export order to Malaysia and the 1971 order of Rs. 9.5 crores to the same country for setting up two 60 MW and three 120 MW boilers in straight competition with a Japanese bid backed by a yen credit are quality production indicators. It is exporting valves to Europe-Germany, France, Poland, at an increasing rate. In the last two years, it has increased these exports ten-fold to over Rs. 200 lakhs. It has earned increasing profits, Rs. 474 lakhs in 1969-70 and Rs. 540 lakhs in 1970-71 and has reduced its government loans from Rs. 21.63 crores to Rs. 8.42 crores. Another important achievement is its import substitution programme, under which its Indian steel material production alone has saved annually Rs. 1 crore of imports. Its rectifier products like gear boxes, dust collectors, foundry castings, etc., have resulted in a net foreign exchange saving of Rs. 21.73 crores in 1970-71. For the current year, 1971-72, the output target is what was established for 1974-75, viz., 27,000 tonnes. As of the end of 1971, there were orders for one lakh tonnes at a value of Rs. 120 crores. It is producing 41 power boilers for all 21 power stations in the Country and 27 industrial boilers for various projects. Its programme of diversification has linked its production with that of Atomic Energy Commission needs. At Kalpakkam, the second unit of the Madras Atomic Power Project has been commissioned at a cost of Rs. 50 crores. This Reactor Research centre is located between the Atomic Power Station and Mahabalipuram. The Tiruchirapalli plant is to manufacture the steam generators for this, the second 235 MW Nuclear power station. The plant is also expanding out to the production of paper recovery units. The sound record is in the main traceable to proper planning and sound management. The planning was accurate and wisely allowed for acceleration of production. The management has been modern and the staff overheads are very low for a public sector undertaking. Its high quality and young staff have thus many achievements to its credit. Mr. H. S. Rao, Chief, Quality Control in the plant has been awarded the metallurgist prize this year for his contribution to mettalurgic technology.

Electronics : The first electronics industrial estate in the State is being developed in Adyar in close proximity to Indian Institute of Technology, Madras and the CSIR regional complex. The 10.27 acre site will have 45 units at a total cost of Rs. 45 lakhs. Eighteen units and 10 entrepreneurs have started work. The State is a late starter in this important field. The Electronics Commission which has now been established for the Country needs to concentrate its attention and help in the small sector which can produce goods with limited investment, leaving to large industrial plants the production of sophisticated instruments. The Commission can help the Industrial Estate in processing its requests quickly, provide research and consultancy services and aid in the integration of the Computer Centre that is to be established at the IIT, with the needs of the nascent electronics industry. Above all the Commission should take up the promise recently given in the Rajya Sabha by the Minister of Foreign Trade that procedures for licensing in the small scale sector would be streamlined so that a decision on requests will be reached within 90 days. *In fact*, as far as electronics are concerned, the present method of licensing industries and import needs for each industrial project should be replaced by industrial plans—that is, by the product and growth pattern as well as the optimum financial, technical and manpower use of each individual industry.

Electricals and metals : Another first in the State is the Rs. 13 lakh electrical testing laboratory in Kakkalur, 30 kilometres from Madras, where small-scale electric industries will be provided with testing and certification facilities at nominal cost for electrical motors, fans and heaters. This service will both ensure quality production and help in the development of new products in this small-industrial sector. The Central Electo-Chemical Research Institute at Karaikudi has developed a number of techniques to recover metals from waste materials like scraps, tannings, spent fluxes, etc., Its new electrolytic process recovers from waste materials like galvanisers ash, zinc in powdered form, tin from tinplate scraps, copper powder from copper oxide. Here are investment opportunities for small industries. A Rs. 5.62 lakh plant using this technique can recover 300 tonnes of tin per year. A Rs. 5.97 lakh plant can produce 500 kg. of copper powder per day. And the cost of the new technique is 30 to 50 per cent less than the conventional ones. Given the growing demand for metals in the Emergency economy and the reduced import facilities caused by the suspension of aid, these small metal industries using these techniques which are cost-effective should be launched in the State.

Steel : Reference has been made earlier to the improved prospects in the country for steel output. Three initiatives in the State add to this improving position from the distribution and sales end. The Hindustan Steel has established its second stock-yard at Coimbatore. Located conveniently near the Peelamedu Railway Station, the office will be expediting distribution of iron and steel materials to the foundries and the metal consumers in the complex. This meets a long-standing need for an assured and timely supply of iron and steel. Through this branch some 30,000 tonnes of iron and steel products will be speedily distributed to the small units. Kaveri Structurals at Tiruchirapalli will be exporting for the first time Heavy Pressure vessels and furnace structures. The order from Iran valued at over Rs. 50 lakhs is to be followed by further exports, provided permission to expand the capacity of these plants are speedily processed and there is an assured supply of raw-materials to the firms. The Billet Re-rollers Committee (BRC) has increased capacity utilisation of billets from 35 per cent to 52 per cent in the State. The

46 re-rolling plants in the South are part of the country's 120 units with a one million tonnes capacity. With assured supply of steel billets both indigenous and imported, the price of re-rollers has fallen in Madras by Rs. 100/- per tonne and is likely to be reduced by a further Rs. 150- per tonne. The Tamil Nadu State Electricity Board has been allowed by the Union Government to import 10,000 tonnes of billets and these have been supplied to the rolling mills in the State for meeting the Board's product demand. The supply position for rollers is thus considerably eased.

Small Industries: The servicing of small industries by the Tamil Nadu Small Industries Corporation has eased the steel situation in the State. It has supplied iron and steel materials at the rate of Rs. 4 crores during the current year. It holds work orders for 28,000 tonnes of non-flat items and 15,500 tonnes of flat items. Last year, it obtained 130 tonnes of imported stainless steel and 68 tonnes of indigenous stainless steel. It is servicing soap industries with 355 tonnes of mutton tallow and the match industry with match and paraffin wax of 8,000 tonnes per annum. It is also purchasing and distributing soda ash to small units. Coir production in Thanjavur, with its half-a-lakh acres under coconut, producing 60 lakh coconuts valued at Rs. 1.5 crores, demands the attention of the Corporation. With the Maniam defibering machine producing 500 kilos of fibre per day from 3,000 husks per hour, the quality problem—strength, finesse, freedom from filth and dust—has been assured. The major problem on which SIDCO can help is the market prospect. Except for bristle fibre, the internal market is limited and externally the product faces serious competition from synthetic and other hard fibre products. Scientific production and use of the product in many small industries can provide an assured market on which the organisations' marketing and consultancy services are needed.

The organisation's export activities in de-oiled groundnut cake, cement, cigars and handicrafts and handlooms are also an expanding and important service. In this connection, the State's handloom production which is essentially export-oriented faces a serious problem due to the frequent rise in raw materials cost in the industry—cotton, dye-stuffs etc. The result is that the handloom producers are not able to meet the orders from Europe and Japan at the quoted prices. Crepe fabrics for which large orders from Scandinavia have to be met, have in the last two weeks had a 20 per cent cotton crepe price rise. Karur's seer sucker also in great demand faces similar increased cost. Ribbed and checked cottons from the State exported to Japan face the dilemma of frequent changes in price quotation or production losses. For handloom exports to traditional markets in Malaysia and Singapore, price increases have reached non-competitive levels. In order to maintain and expand both traditional and non-traditional export markets and meet these rising costs of raw materials that the handloom industry faces, both SIDCO and the Handloom Export Promotion Council could devise and administer a cost-based export incentive scheme, under which the index number of costs for the different handloom items can be linked to their incentives. In this way export orders will be honoured at quoted prices.

The State Government has further liberalised and decentralised financing arrangements for small industries. While the Tamil Nadu Small Industries Development Corporation would itself review and approve loans from Rs. 25,000/- upto Rs. 1 lakh, the District Industrial Development Committee under the chairmanship of the Collector will

approve loans upto Rs. 25,000/-. Further, the Additional Director of Industries will approve loans upto Rs. 5,000/- and the Regional Deputy Director upto Rs. 7,500/-. This decentralisation should speed the development of small industries in each district of the State.

Power : The State is to electrify all its villages and hamlets by 1972. It energises 50,000 pumpsets annually. And on this basis the anticipated power deficit in 1973-74 for the State will be 630 MW. The demand at that time will be 1835 MW for which a generating capacity of 2200 MW will be required. By 1980, the short-fall will be 3,000 MW (See Bulletin Vol I. No. 7). Thus the long term plans to meet the power requirements of the State include a 600 MW thermal plant at Tuticorin and a 1,000 MW (Second) Atomic Power Station in one of the Southern districts of the State. The proposed Indo-Ceylon Electricity Grid may also be a means of meeting the State deficit. During the remaining two years of the Fourth Plan, the power project include the Kadampari pumped storage scheme which can store 200-400 MW during the weak night load for use in the day, the Suruliyar scheme (35 MW), Servalar Power Base (35 MW), Nellithorai Scheme (35 MW), Paraliar Scheme (5) MW) and Cholatipuzha Scheme (60 MW). The most urgent project to meet the power shortage is to open the second mine-cut and set up another power house of 600 MW at Neyveli. In this connection, the rationalisation of present mining operations at Neyveli, including improved equipment and maintenance procedures and scientific inventory control system, would make available the requisite quantities of lignite to operate the different consuming units at optimum levels and also straighten out the operational and process difficulties in the fertilizer plant.

Oil : The 22 million target for 1973 may have to be advanced by a year in the present situation in the country and for this the Haldia construction schedule should be speeded up. Madras Refinery can increase its throughput to 2.8 million tonnes and with some additional balancing equipment can increase its production even further in order to contribute to the revised target proposed for 1972. The recent Kerosene rationing is a useful and necessary measure to ensure that this poor man's fuel is available to him in adequate amounts and at reasonable prices.

Some private sector developments : The Manali complex will have a Nylon cord plant added to it by Sri Ram Fibres on a 150 acre site allotted to it. Sakthi Sugars will start the third State distillery with a manufacturing capacity of 10.5 million litres of alcohol per year at Appakudal. At present the State imports 10 lakh litres alcohol every month. The industrial demand for alcohol is 13 million litres per annum. With the licensing of three factories for bottled liquor and three beer breweries, the State needs for alcohol and liquor will be met by the installed units in the State. The 1971 record of Seshasayee Paper and other units in Andhra, West Coast and Mysore are good and at capacity. But new schemes for expansion require coordinated supply of several raw materials and components. This must be achieved to meet the increased demands for paper and boards that the Country will face in 1972. The Metal Powder company has steadily expanded its services and production and today produces 600 tonnes of pyrotechnic aluminium powder and 600 tonnes aluminium paste product. Like cement which is once more going through a period of glut because, while its production is at capacity its major market which is in the North cannot be served given the bottleneck of the transport

system, the market for the paste product is in the north and the returns on the Rs. 20 lakh paste plant will depend on the proper scheduling of wagons. The pyrotechnic plant has a growing and flourishing local consumer in the Fire Works of Sivakasi. Binny's half-year report for 1971 shows continuing losses due to a variety causes—cotton costs, lag in modernisation of the weaving section in Madras, industrial strife in Bangalore. All these have reduced profit margins despite product price increases. The forecast for an improved showing in the second half of the year must now be realised, given the kind of pressures the economy faces. The tyre industry may be turning the corner (see Bulletin Vol 1 No. 6) and picking up. The expanded facilities of Ceat Tyres, Madras Rubber, Good Year, Ambattur Unit of Dunlop will ensure that 1971 production will improve on the 1970 record. Now the production efforts need to be intensified, all exports of carbon black stopped, and with industrial peace assured, the 1972 target should be about 30-40 percent higher than the 1970 and 1971 results. Ashok Leyland's expansion programme, increasing from the present 5,000 comets to 7,000 by 1972 and 10,000 in 1974 and its heavy duty vehicles to 2,000 are based on a nationally and internationally recognised record of sound and quality production. The State and Union Governments should facilitate this sound plan in every way.

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Education and Science :

Education Reform : Educational reform is in the forefront of discussion at all levels in the State. The State Planning Commission's Task Force on Education, Science and Technology which is engaged in drafting a twelve-year perspective education and science Plan for the State (1972-1984) is engaged in an analysis of the existing system and the major far-reaching regeneration and restructuration needed in the State's future education and science system. There is a general desire in the State on the part of students, teachers, parents, educators, scientists and government for basic educational changes which would bring the State's educational system into line with the skill demands and employment opportunities of society. The State government's expert committee has prepared a new draft syllabus for standards I to V with the aim of promoting objectivity, the appropriate interests, attitudes and values as well as developing useful skills in students. Reform in English teaching from Standard-III to X, through structural teaching, in moral instruction and in the number of instructional days for each stage of education is recommended. This proposal is the subject of wide ranging consultation with teachers and educators in the State. The Annual City Headmasters Convention in December examined the reformed syllabuses, in light of its general theme of promoting quality education in high schools, and gave the programme its general endorsement. The functional nature of the school syllabus, functional in relation to the rural agricultural environment for the majority of schools which are rural and functional in relation to urban problems for urban schools, is something that has to be worked out in each school. The Dimli high school where the student centred syllabus includes growing fruits and vegetables in 35 cents of land..., and paddy in another 35 cents because the children come from farm families and plan to return to work on land, is receiving wide attention.

An Advanced Training Institute to train highly skilled craftsmen has been started in Guindy in November. The first 32 trainee craftsmen have been sponsored by private and public sector industrial units for an advance course in tool design and machine tool maintenance. This programme not only meets the short supply of advanced craftsmen that industry with sophisticated machinery faces, it is also a much needed bridge between industry and education in the State and the Country. It will also help in reforming technical training and education in the system generally. The Television tool is now in use in the State in the Technical Teachers' Training Institute in Adyar. It is a closed circuit television unit, gifted by the United Kingdom (CEDO) and will improve the quality of education and training first in the Institute and later in the State's polytechnics. In two years, the State will have its Television Station and this first programme is an important preparation for using this technology in the reformed educational system. It could also act as a generator of reform.

Examination reform continues to be under discussion. On the occasion of the discussion of the report of the University Grants Commission in the Lok Sabha, the need for reforming the examination system to make it a more objective evaluation of students' ability was widely emphasised. The major lines of the reform have been clearly set forth in the report on examination reform of the committee appointed by the Central Board of Education. It is to limit examinations to three stages in the life of the student and to make them an evaluation of ability and personality. Its adoption is now in the hand of the States, their governments, their educators, parents and universities.

Reform of higher education is also under constant study. The need to make the Pre-University programme of two years duration instead of the present inadequate one year is under study in the Madras University. Remodelling and upgrading of university studies, a wider variety of subjects with the freedom to specialise in areas suited to the student and his employment prospects, the semester or trimester system; refresher programmes for university teachers, smaller classes, discontinuance of heavy State financing of non-professional and run of the mill of higher education, further guidance of stu- to vocational streams and into the employment market, increasing the number of quality dents institutions—all these are under study. In the Lok Sabha there have be en strong demands for associating students in the governance of university affairs. The recent reaction of Madras University students to proposals for reforming convocation procedures point to the need for devising effective machinery for consulting students particularly in matters concerning them—as was requested of college principals by the university during its study of the whole convocation procedure.

Liberal Arts Colleges: Visits to Voorhees College, Vellore, the Arignar Anna College of Arts for Women, Walaja, and Sri Pushpam College, Poondi, showed wide interest in the movement to upgrade and improve higher education in the State, in midst of the many constraints in building, staff, equipment library and laboratory that institutions face. Interest in UNESCO and international cultural relations have led them to form their own UNESCO Mandrams Units: The major issue is the future prospects and work opportunities for these thousands of young men and women who have come crowding into these institutions. Two decades ago there was only one of the three institutions in existence with an enrolment of 200 students. Now the three colleges have an enrolment of 6,000 students under conditions in which higher education is unrelated to its purpose and function.

I.I.T. The Indian Institute of Technology, Madras is emerging as a major scientific and technological institution for the State. It has devised sophisticated equipment for the rocket launching stations at Thumba and Sriharikotta, precision parts for the railways and complex electronic and mechanical equipment for the Atomic Energy Commission. It is providing over 500 consultancy services to 150 private and public sector firms. It acts as the scientific consul and technologist to the city anti-pollution programme, particularly the smoke nuisance. It will act as the guide and advisor to the integrated electronics industry now developing in the State and referred to earlier. The biggest computer in the country costing Rs. 1.5 crores is to be installed in the Institute, with the help of the West German Government and its multi-programming facilities will be available to the entire Southern region. It should also plan to coordinate the various computer centres in the State including the new Police Computer Centre which will become operational in 1973.

Pulsars : Two new tiny celestial bodies called Pulsars have been discovered by the Ootacamund Radio Telescope in the State of the Tata Institute of Fundamental Research. The first Pulsar rotates once every 194.6 milli-seconds and the second every 659.4 milli-seconds. The Ootacamund astronomers used Indian designed high sensity telescopes in making this discovery.

Science Research : The proposal to set up a Tamil Nadu Development Research Council is under favourable consideration of the State Planning Commission. In the meanwhile the National Committee on Science and Technology has been assigned immediate research task on defence priorities. In the State, the Minister of Industry has once more called upon industrial firms to join with the Government and organise research of immediate relevance to the State's industrial prospects and needs. He emphasised that fruitful research in the State should be taken up as a co-operative venture, however expensive, and promised that Government would contribute its share to such a joint enterprise. This is an urgent task which the State Planning Commission should pursue.

Agricultural Research: The Tamil Nadu State Agricultural Research Council has been launched with the Director of Agriculture as chairman to formulate and guide agricultural research not covered by the Agricultural University. The Agricultural Research Stations outside of Coimbatore and Madurai, and the research projects financed by the State and the Indian Council of Agricultural Research in the Five Year Plans will be guided and directed by the State Council. Agricultural research and extension work has a very large area to be covered and in the initial years it may be useful to have this Council in addition to the Agricultural University. In time, however, that is by the start of the Fifth Plan, this Council should become a part of the Agricultural University whose major raison de'etre is the co-ordination, direction and stimulation of agricultural research and extension in the State.

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Employment :

The State has proposed to the Union Government a Rs. 6 crores network of spinning and weaving centres in rural areas. The scheme will provide 18,750 jobs for the unemployed. The skills required are simple and elementary and can be learned on the

job. Three hundred and seventy-five (375) rural textile units capable of producing 30 million metres of furnishing fabrics will be established, using the nearly complete electricity supply in the State villages. Each unit will cost Rs. 1.60 lakhs and will have a combination of 12 spindle frames and a loom, all made in the State and operated electrically. The yarn provided will be in the lower count range and the educated and uneducated unemployed who will work in the centres will earn a minimum of three rupees per person per day. The project while concentrating on fabrics can also meet the urgent and mounting demand for coarse cloth by the majority of rural consumers. It would be a useful and needed supplement to the output of the organised textile sector. Given the inadequacy and slowness of the State's part of the Central Goverment's Rs. 50 crores crash programmes in meeting the growing unemployment problem, which have been the subject of discussion in the Rajya Sabha and the State Legislature, the Union Government should approve this urgent programme with its double objectives of meeting the demand for cloth and providing employment.

The Tamil Nadu Industrial Investment Corporation has launched its scheme to help technically qualified persons to go into fruitful self-employment. (See Bulletin Vol I No. 7). The organised sector's employment opportunities are about one third the number entering the labour market in the State every week. Under this scheme, qualified diploma and certificate engineers will be given a loan ranging from Rs. 10,000/- to Rs. 2 lakhs for setting up small industries employing modern techniques. The loans will have a three years' grace period and after that must be repaid in seven annual instalments. This important project will, on the basis of experience, need to be considerably extended to meet the technical unemployment backlog in the State.

The prospects of emigration and resettlement as a means of meeting un-employment in the State are limited. The approved programme for settling 1,000 unemployed Ceylon repatriates in the Kachal island in the Andamans where 6,000 acres have been set aside for growing rubber is one such project. In the coming fifteen years, five lakhs of Tamilians will be repatriated from Ceylon. Forty-thousand of these have already arrived and work for them must be found. In Little Andamans also, 10,000 acres have been allotted for repatriate settlement. It is necessary to establish quick and easy communication between Madras and the islands.

The State Government has reserved 49 per cent of its employment for Scheduled Castes, Scheduled Tribes and Backward Classes. Of the 49 per cent reservation, 31 per cent is reserved for the Backward Classes and 18 per cent for the Scheduled groups. The total service opportunities are limited, but, even within these limits, this decision is an attempt to compensate the discrimination suffered by this sizable group of citizens in the State.

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Asian Regional Seminar :

Over 100 specialists from Philippines, South Korea, Taiwan, Malaysia, Singapore, Ceylon, India, Australia, Japan, Indonesia and Thailand met in a seven day seminar in Madras organised by the World Movement of Christian Workers to study the challenge of the seventies for Christian Workers in Asia. The Seminar dealt in depth with the econo-

mic and social development programmes and problems in Asia, the problems of the Asian workers and the strategies for action by individuals and groups. In a concluding pledge they declared : "We recognise that the problems of workers in Asia especially in the Socio-economic sphere, are of such magnitude and diversity that they can be solved only in collaboration with all men of good will, with men who are deeply committed to the liberation and the integral development of man. We shall place ourselves solidly behind our governments in all their radical moves in the struggles against inequalities and injustices". This is the development call to every one in Tamil Nadu and Asia.

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Asian Area Research Programme :

The Indian Council of Social Science Research called a Committee of twelve social scientists in November to review the Asian Area Research programmes being undertaken in the Universities and other institutions. Area research on China, Pakistan, Ceylon, Indonesia, Thailand, and other countries are under way in a number of such centres. It was recognised while country studies are fairly well developed, problem oriented research and collaborative studies are lagging. There is need for promoting Asian Languages teaching, establishing co-operative relations with the social scientists of the countries concerned, and much larger financial assistance for both staff facilities and adequate research scholarships. It was also seen that this is an area where an inter-disciplinary methodology has to be planned and rigorously developed. Both the UGC and ICSSR are involved in assisting these programmes and there is need for defining precisely the role and responsibilities of the ICSSR in this area. The Council should publish a journal of Asian Studies. A seminar to carry forward this review is planned early in 1972 to be followed by a seminar of Asian Social Scientists to be held in Delhi in September 1972 both to promote teaching and research in the social sciences in the countries of Asia and to develop closer contacts between Asian social scientists.

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Advisory Committee of MIDS :

The second meeting of the Advisory Committee of the Madras Institute of Development Studies met on November 26, in the Seminar room of the Institute to (a) review the work accomplished in 1971, and (b) advise on the Institute's programme for 1972. It

noted with satisfaction that three of the studies for 1971—Problems of Dry Farming, Social Stratification and Trends of Income Distribution of the Harijan Community, Rural Primary Schooling and Adult Literacy—have been completed. Two studies—Manpower demands in the Rural area and Rural-Urban terms of trade—will be completed in January 1972. These studies result in policy advice to the State Government. The Institute's documentation centre needs to be strengthened on Tamil Nadu development documentation, with the help of the three universities in the State. The monthly seminar programme has been successfully executed. The six week workshop on Economics research methodology and the three day seminar on consumer-user oriented research were reviewed with satisfaction. The Committee congratulated the Institute on the publication of the Monthly Bulletin and suggested that the mid-year special number on the state of social science research in Tamil Nadu be further enlarged. It noted that in 1971 two publications—Economics of Dry Farming Technology in Tamil Nadu and Income Earning Trends of the Harijan Community in Tamil Nadu—have been sent to press.

In regard to 1972, the Committee recommended :

(a) a programme of studies which will comprise of
  - (i) Education and social factors involved in the Scheduled Castes of Tamil Nadu,
  - (ii) Land Reform in Tamil Nadu,
  - (iii) Marketing of agricultural products in Tamil Nadu,
  - (iv) A State-wide programme of low price supply of rice, cloth and kerosene for the urban and rural poor and
  - (v) Utilisation and pricing problem of irrigation in the Thanjavur District.

(b) A programme of monthly seminars which is reported separately.

(c) A two-day seminar to be organised in co-operation with the State Planning Commission on Perspective Planning.

(d) A second six week workshop on Economics Research Methodology.

(e) Two fellowships from the ICSSR for two Asian and African Social Scientists.

(f) Publication of the monthly bulletin and four monographs.
  - (i) Rural Employment in Tamil Nadu.
  - (ii) Primary Education and Adult Literacy in Tamil Nadu.
  - (iii) Rural-Urban Terms of Trade, and
  - (iv) Guide to Economics Research Methodology.

(g) A book on Economic Theory and Analysis written by Indian Economists.

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1972-Monthly Madras Development Seminar :

The Advisory Committee and the November Seminar approved the following Monthly Seminar Programme for 1972.

(a) **Members :**

1.	C.M. Abraham	Sociology	Madras
2.	M.S. Adiseshiah	Economics	Madras
3.	M.S. Appa Rao	Business Management	Madras
4.	M.V. Arunachalam	Business Management	Madras
5.	B.N. Chinnappa	Statistics	Madras
6.	S.V. Chittibabu	Education	Madras
7.	A. Devasia	Economics	Madras
8.	Haji N.V. Noor Mahammed	Juridical Science	Madras
9.	K. Jhaveri	Education	Pondicherry
10.	P.V. Krishnamoorthy	Mass Media	Madras
11.	C.T. Kurien	Economics	Tambaram
12.	J.P. Naik	Social Sciences	Delhi
13.	T.S.R. Narasimhan	Public Administration	Madras
14.	T.V. Natarajan	Public Affairs	Madras
15.	K.K. Pillay	Human Science	Madras
16.	P.K.S. Raja	Social Science	Annamalai Nagar
17.	C.D. Rajeswaran	Economics	Madras
18.	A. Ramachandran	Engineering	Madras
19.	J. Ramachandran	Political Science	Madras
20.	A. Ramakrishnan	Science	Madras
21.	B. Ramamurthy	Statistics	Madras
22.	S. Ramanathan	Sociology	Madras
23.	R. Ramanujam	Economics	Madras
24.	M.N. Rao	Business Management	Madras
25.	T.S. Sadasivan	Science	Madras
26.	S. Sampath	Engineering	Madras
27.	V. Shanmugasundaram	Economics	Madras
28.	C. Subramaniam	Public Affairs	Delhi
29.	T.S. Venkataswami	Economics	Madras
30.	R. Venkatraman	Planning	Madras

(b) **Programme** :

Theme : Science and Technology for Indian and Tamil Nadu Development.

Subject	*Author*	*Chairman*	*Date*
New Agricultural Technology in Tamil Nadu	B. N. Chinnappa	T. V. Natarajan	Friday, 28th January
Inter-State Rivers	Haji N.A. Noor Mohammed	M. S. Appa Rao	Thursday, 24th February
Automation and Computer Technology	S. Sampath	A. Ramakrishnan	Thursday, 30th March
Chemical Industry	T. S. Venkataswami	B. Ramamurthy	Friday, 28th April
Inhibiting Factors in Indian Society	N. Subramanian	M. N. Rao	Thursday, 25th May
Development of Irrigation and Rural Water Supply	S. Ramanathan	C. T. Kurien	Thursday, 29th June
Export-oriented industries in Tamil Nadu	A. Devasia	M. V. Arunachalam	Thursday, 27th July
Communication Industry	V. Shanmugasundaram	P. V. Krishnamurthy	Thursday, 31st August
Religious values and Science	C. M. Abraham	R. Venkatraman	Thursday, 28th Sept.
Application of Scientific Methods in Family Planning	C. D. Rajeswaran	J. Ramachandran	Thursday, 26th October
Microbes and Man	T. S. Sadasivan	S. V. Chittibabu	Thursday, 30th Nov.
Student-Teacher Relationship	K. K. Pillay	K. Jhaveri	Thursday, 28th Dec

(e) Procedures :

The seminar procedures are :

(1) The approved calendar will be adhered to.

(2) Each month's author will send his manuscript to the Institute by 15th of the month so that it can be reproduced and circulated ten days before the seminar meeting.

(3) The seminar paper will contain the invitation and reminder of the date and time of the seminar so that the separate typed invitation sent in 1971 can be discontinued.

(4) The seminar will meet on the last Thursday of every month from 5 p.m. to 6.30 p.m. in the Seminar room of the Institute.

(5) The Chairman of each month's seminar will conduct the discussion. As the paper is circulated in advance, the author can choose not to introduce his paper or speak for not more than 15 minutes either bringing out points not covered in the paper or emphasising certain highlights.

(6) The monthly seminar paper together with the summary of the discussion on it will appear in the following month's issue of the Institute's bulletin.

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Preparatory Meeting for the second workshop on Economics Research Methodology :

The preparatory meeting for the second workshop on Economics Research Methodology organised by the Institute in co-operation with the ICSSR on December 10 and 11 was attended by .

Dr. V. Anantharaman,
Prof. & Head of the Department of Economics,
Indian Institute of Technology,
Guindy, Madras-36.

Dr. V. Shanmugasundaram,
Prof. & Head of the Department of Economics,
University of Madras,
Chepauk, Madras-5.

Dr. A. Ramaswami,
Prof. & Head of the Department of Economics.
Annamalai University.
Annamalai Nagar, Chidambaram.

Miss Gajalakshmi,
Prof. & Head of the Department of Economics,
Madurai University,
Madurai - 2.

Dr. V. Rajagopalan,
Prof. & Head of the Department of Economics,
Tamil Nadu Agricultural University,
Coimbatore.

Dr. G. T. Huchappa,
Prof. & Head of the Department of Economics,
University of Mysore,
Manasa Gangotri, Mysore - 6.

Dr. B. Sarveswara Rao,
Prof. & Head of the Department of Economics,
Andhra University,
Waltair, Andhra Pradesh.

Dr. D.L. Narayana,
Prof. & Head of the Department of Economics,
Sri Venkateswara University College,
Tirupati, Andhra Pradesh.

Dr. C. T. Kurien,
Professor of Economics,
Madras Christian College,
Tambaram, Madras - 59.

Dr. V. Karunakaran,
Professor of Economics,
Sree Narayana College,
Cannanore, Calicut.

Dr. Malcolm S. Adiseshiah,
Director,
Madras Institute of Development Studies,
74, Second Main Road, Gandhi Nagar,
Adyar, Madras - 20.

Four Heads of Departments of Economics :

Dr. D. N. Nanjundappa,
Prof. & Head of the Department of Economics,
Karnatak University,
Dharwar - 3, Mysore.

Dr. G. Mathur,
Prof. & Head of the Department of Economics,
Osmania University,
Hyderabad - 7, Andhra Pradesh.

Dr. P.G.K. Panikkar,
Prof. & Head of the Department of Economics,
Kerala University,
Kariavattom P.O.,
Trivandrum.

Dr. Venkatagiri Gowda,
Prof. & Head of the Department of Economics,
Bangalore University,
Bangalore - 9.

had to cancel their attendance because of disruption of air travel due to the National Emergency. The meeting recorded its profound sorrow at the death of Prof. N.C. John of Cochin University in the air crash at Madurai.

The main conclusions of the meeting centred around three subjects.

A. Programme and arrangements for the Second Workshop on Economics Research Methodology :

The major constraints in economics research in the Southern Universities are (a) lack of adequate knowledge of the subject matter or speciality, (b) lack of knowledge of research tools and (c) lack of adequate communications competence. The workshop should be planned in light of these constraints.

The membership of the workshop will be limited to 30-35 participants from the 12 Universities of the four Southern States and will be those who are (a) planning to take up Ph.D. economic research and (b) those who have recently registered for Ph.D economics research. Each Head of the department will be requested to nominate the number of participants allotted to his University, using his discretion in making the nominations for the workshop, which will be tailored to meet the needs of those starting Ph.D. research.

The workshop will be run for a six week duration from May 8 to June 17, 1972 in the Department of Economics, Andhra University, Waltair. Dr. B. Sarveswara Rao will be the Director of the workshop.

The daily programme of the workshop will consist of four sessions ;

(a) 9.00—10.30 a.m.: Plenary workshop sessions where the following basic papers will be discussed :

	Themes	*Suggested Authors*
1.	The latest development in Economic Theory	Prof. Topuz Mazumdar Prof. V. Shanmugasundaram
2.	Identifying Economic Research Themes	Prof. C. T. Kurien
3.	Formulation and Testing of Hypothesis	Dr. Krishnamurthy
4.	Use of Statistics	Prof. Ranganathan

5. Use of Case Studies	Prof. K. Sonachalam
6. Use of Survey Methods (a critique of some surveys)	Prof. D. L. Narayana Prof. B. S. Rao
7. Use of Census Data	Mrs. Chinnappa Mr. Visaria
8. Use of National Sample Survey Data	Prof. Ekambaram
9. Use of Documentation	Mr. Neelameghan
10. Forecasting and Model Building	Mr. Srinivasaraghavan
11. Project Evaluation	Prof. Bhattacharyya Prof. B. S. Rao
12. Structure of a Ph D. Thesis	Prof. Ramaswamy

It was suggested that the author of each paper should include at the end of his paper an annotated bibliography. The paper should be sent to each participant by 1 April, 1972 at the latest.

(b) 11.00 a.m.—1.00 p.m. : A Course in Statistics comprising.

1. Descriptive Statistics — 4 hours.
   - Central tendency
   - Dispersion
   - Skewness

2. Mathematics — 12 hours.
   - Permutation and combination
   - Set theory
   - Differentiation and Integration

3. Probability — 12 hours.
   - Definition
   - Theorems of Probability
   - Probability Distributions :
     - Binomial
     - Normal
     - Poisson

4. Statistical Inference — 12 hours.
   - Estimation
   - Testing of Hypothesis
   - Test of Significance and Analysis of Variance

5. Correlation and Regression   8 hours.

    Simple Correlation
    Partial Correlation
    Multiple Correlation and Regression

6. Economic Statistics   12 hours.

    Index Numbers
    Time Series
    National Income Statistics

The Director of the workshop will provide from the staff of the University the lecturers for the six subjects. On each subject and sub-subject the lecturer should prepare a hand out dealing with the field, with special references to Indian conditions and indicate the prior work that participants should do on each subject before coming to the workshop. At the end of each lecture, the work to be done by the participants before the next day will be established. These hand outs should be sent to the participants by 1 April, 1972.

(c) 3-00--4-30 p.m. : Specialised Groups.

Groups	Suggested Authors
Agricultural Economics :	Basic Papers by Prof. Vyas, Prof. Parthasarathy.
Monetary Economics :	Basic Papers by Prof. Khusro, Prof. Brabmananda.
Development Economics :	Basic Papers by Prof. Ramasamy, Prof. Ranganathan.

A Fourth Group to be established in light of the special subject interests of the participants.

These papers should deal with broad outlines of the subject fields and the major research themes appropriate to local conditions that the author may wish to suggest for consideration of the group. These papers should be mailed to the participants by 1 April, 1972.

(d) 5-00—6-00 p.m. : Individual discussions with the Director and Resource Personnel.

The following specialists may be invited as Resource Personnel to the workshop for one week each :

Prof. Ramaswamy.

Prof. Kurien.

Prof. Shanmugasundaram;

Prof. Bhattacharya.
Prof. Brahmananda.
Prof. K. N. Raj.
Prof. Nanjundappa.
Prof. Panikkar.
Prof. S. N. Sen.
Prof. S. Paul.
Dr. Bharthwaj.
Mr. Srinivasaraghavan.
Prof. C. H. Hanumantha Rao.
Dr. L. S. Venkataramanan.
Dr. Panchamurthy.
Prof. Sardesai.
Dr. Kala.
Mr. V. V. Bhatta.
Mr. Narasimhan.

B. Problems and Prospects of economic research in the Southern Universities :

After a detailed discussion of the status of economics research in each of the Southern Universities, the following general recommendations were adopted.

(a) The Indian Council of Social Science Research should be urged to establish a data bank in the Southern region as speedily as possible.

(b) The Union and State Governments should make speedily available to the Universities their published data at the Central, State and District levels.

(c) The MIDS mid year Special Bulletin should continue and further improve its reporting on the status of research in the Universities and colleges in Tamil Nadu in order to keep research workers informed about the state of research and help avoid unnecessary duplication.

(d) There is need for coordination and leadership of applied agricultural research in Tamil Nadu through the Agricultural University.

(e) There is need for closer contact between the agricultural economics research staff of the Agricultural and Traditional Universities. Staff exchanges between the two groups of Universities should be developed.

(f) Social Science research requires a critical mass of staff which most South Indian Universities lack. The strengthening of social science senior research staff is the pressing future need of the Universities.

(g) The social science problem of the South should bring the specialists from the Southern Universities closer together. More and regular meetings like the current one are desirable.

(h) There is need for a sizable increase in Ph.D. research scholarships in the Universities.

(i) A Ph.D. thesis should be essentially evidence of analytical ability, clarifying and testing a hypothesis. It should not obligatorily (a) involve original formulations or (b) require large scale primary data collection. All Ph.D. candidates should be provided with a methodology course.

(j) More Indian external examiners for Ph.D. evaluation should be employed.

(k) University departments should organise refresher course for 4-6 weeks for college economic teachers.

C. Project for/Book on Economic Analysis by Indian Economist:

Existing Work: A UGC project for writing University level monographs exists, under which a University senior staff is given three years and a fellowship of Rs. 500/- per month for an assistant for producing the monograph. Prof. Ramaswamy of the Annamalai University is engaged in writing a monograph on Agricultural Economics under this scheme. The Andhra University is also planning to enter the scheme. Prof. K. N. Raj and Mr. A. K. Sen have been working on economic monographs. Prof. Dandekar has also underway a similar project.

Is there need for a book by Indian economists on economic theory? Have we, economists got a sufficient analytical position in India? Is there as yet an Indian economic theory? There is clearly a need for a book on the Indian economy. There is also need to analyse current theories in light of Indian conditions. There is need to integrate economic theory to Indian conditions, particularly in relation to our Institutional structures. But the proposal is for a work on Economic Analysis written by Indian economists.

Messrs. V. V. Bhat, K. N. Raj, Dandekar and B. S. Rao are economists who could be associated in a project to develop a book on Economic Analysis in the country.

This subject needs further thought. Members are invited to write to the Director of MIDS on this proposal. Further consideration of the project will be taken up at the second workshop in Waltair.

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December Madras Development Seminar:

The December 1971 Seminar paper—"Problems of Growth in Tamil Nadu—1970" by Dr. Malcolm S. Adiseshiah, Director, Madras Institute of Development Studies, together with a summary of the discussion on the paper at the seminar chaired by Mr. M. V. Arunachalam, Director, Tube Investments of India Ltd., Madras appears as the main article.

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Second Article:

Another article "Educational Planning in Tamil Nadu" appears as the second article.

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Correspondence :

In this Section is reproduced an exchange of correspondence between Mr. Narasimhulu of Osmania University and Dr. C. T. Kurien of Madras Christian College on Dr. Kurien's article on Research Methodology in Economics. Vol. I No. 6, Special Issue.

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Our Printers :

The Advisory Committee of the Institute recommended that it should be made known that the monthly Bulletin is composed, set, printed and bound by a group of deaf and dumb boys. The St. Louis Institute Press, Adyar, Madras, houses and educates 158 deaf and dumb boys from Tamil Nadu and it is they who help to bring out regularly the Bulletin. Its neatness, correctness and punctiliousness are a tribute to the technical and human qualities of the members of the Institute.

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PROBLEMS OF GROWTH IN TAMIL NADU—1970

By

DR. MALCOLM S. ADISESHIAH, *Director*
Madras Institute of Development Studies

Definitions and limitations.

Measuring Growth:

1. Growth is here used in the classical sense as a phenomenon measured by the movement of the total State income or per capita income of the State. Here if the two incomes, total and per capita are increasing, the State can be said to be experiencing growth.

TABLE—I

At current prices—In crores of Rs.

	1961	*1962*	*1963*	*1964*	*1965*	*1966*	*1967*	*1968*	*1969*	*1970*
Total State income.	1129	1214	1256	1370	1497	1548	1915	2126	2176	2443
Per capita income.	335	353	359	384	410	430	505	549	551	606

Source: Tamil Nadu: An Economic Appraisal 1971.

2. Table I shows a steady growth both of the total income of the State and the per capita income. There are three limitations to this conclusion. The first is the usual statistical problems, including those of the methodology of primary data collection, and resulting distortions. The per capita income growth for instance is based on the per annum population increase of 2 per cent derived from the 22.01 per cent increase for the decade 1961-1971 recorded in the provisional results of the 1971 census. This near doubling of the 11.85 per cent population growth reported for the decade 1951-61 can only raise doubts as to the data collection methodology used in the 1961 and 1971 censuses. The second limitation with the table is that it is expressed in current prices and by itself tells us little as to whether there has been an increase in the total volume of goods and services for the State or for the individual for each year. The third problem is the wide variations in income distribution within the State which makes the income aggregates in the table not very meaningful for 70 per cent of the people in the State whose incomes are below Rs. 500/-

3. A little more reliable indicator of growth is to be found in the rate of growth of the State. This is a concept borrowed from biology and attempts to measure growth by comparisons over time and space. Here the rate of growth of the State income and per capita income as compared to those of other States or of India does indicate the growth of the State. The statistical problem referred to under table I is still present, though mitigated by the common sharing of errors and distortions over a wider spatial area.

TABLE—II

Index Numbers of National and State income at current and 1960-61 prices

"At current prices"

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
National income	100	105.7	111.9	128.6	150.9	155.1	177.7	213.4	215.0	234.5
State income	100	107.6	111.3	121.4	132.5	141.2	166.2	188.2	192.8	216.3
National per capita income	100	103.3	106.6	119.7	137.0	137.1	153.6	177.0	177.1	192.4
State per capita income	100	105.7	107.70	115.5	124.2	130.4	150.0	163.9	164.5	180.9
"At 1960-61 prices"										
National income	100	133.5	105.7	111.7	119.8	113.0	113.8	124.8	127.4	135.06
State income	100	104.9	107.4	110.2	112.9	114.3	129.7	124.2	126.0	139.2
Nationa per capita income	100	101.3	100.7	104.1	108.8	100.3	98.4	105.6	104.9	110.8
Tamil Nadu per Capital income	100	102.7	103.6	104.2	104.2	103.6	106.6	108.4	107.5	116.4

Source : Indices constructed from the data in An Economic Appraisal—Tamil Nadu 1971 & Economic Survey 1970-71. Government of India.

4. Table II is a simple computation of the relative rates of growth of total and per capita income of the State and the country at current and constant prices. It shows that at current prices Tamil Nadu's growth measured both in total and per capita income was less than that of the country. It also indicates that at 1960-61 prices, Tamil Nadu's growth of total and per capita income was greater than that of the country except for four years for total income and one year for per capita income. This table has implications for the relative price inflation situation in the country and the State and indicates that the growth path of the State is less unsatisfactory than that of the country. It is necessary to use a little more sophisticated computation to comment on the trend factors of the State and National economy and for this Table III is presented.

TABLE III

Year	*Percentage growth of state income.*	*Percentage growth of National income.*	*Percentage growth of National income of developing countries.*	*Percentage growth of State per capita income.*	*Percentage growth of National per capita income.*	*Percentage growth of per capita income of developing countries.*
1961	...	....	...	...	...	...
1962	4.9	3.5	4.8	0.3	1.2	2.3
1963	2.3	2.0	4.6	0.8	0.2	2.1
1964	2.6	5.7	4.5	0.5	3.4	2.0
1965	2.4	7.2	4.5	Nil	5.0	2.0
1966	1.3	- 5.6	4.5	- 0.4	- 7.6	2.0
1967	4.7	1.5	4.1	2.8	- 0.8	2.2
1968	3.8	9.3	4.8	1.6	6.9	2.3
1969	1.5	2.4	4.9	- 0.8	- 0.2	2.4
1970	10.5	5.3	5.0	8.2	2.9	2.5

Sources : Tamil Nadu : An Economic Appraisal 1901. Corrected by Economic Times Research Bureau publication Aug. 3, 1971.

World Economic Survey 1970 United Nations.

5. Table III shows the trend or direction in which the State, the Country, and the developing world are moving. It shows that as of 1969 for the State income, there was an uneven average annual rate of growth of 2.9 per cent. For the Country the equally uneven average annual rate of growth of National Income was 3 per cent. For the Developing Countries, the National income grew at 4.7 per cent. As of 1969, the annual per capita growth for the State was 0.9 per cent, for the Country 0.6 per cent and for Developing Countries 2.2 per cent. Both for the State and the Country the trends indicated are not satisfactory. It is the trend rather than the situation at any given point of time which is important as a measure of growth. While Table I gives a picture of the total income, State and per capita, Table III indicates the increases and decreases in that total

TABLE IV

Contribution to National Income by Tamil Nadu Economy during 1960

(Tamil Nadu's contribution as percentage of total National income)

Sector	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Agricultural and allied activities at current Prices	8.14	8.1	7.7	7.2	6.46	6.7	7.1	5.7	5.9	Not available
1960-61	8.14	8.2	8.4	8.2	7.4	8.1	8.6	7.6	7.4	8.61
Mining and manufacturing at current prices	6.7	7.00	7.00	6.8	7.07	7.6	7.9	8.3	8.1	Not available
1960-61	6.7	7.00	6.8	6.6	6.9	7.5	7.7	8.0	8.05	7.28
Commerce, Transport & communication at current prices	11.9	11.9	11.9	11.2	9.9	9.8	9.09	9.09	9.00	Not available
1960-61	11.9	10.6	10.3	9.9	9.4	9.6	9.8	9.1	8.3	9.42
Other services at current prices	8.6	9.0	9.2	8.8	8.6	8.6	8.8	11.2	10.9	Not available
1960-61	8.6	9.6	9.7	9.6	9.6	10.0	10.2	10.3	10.4	11.16
Total Income at current prices	8.5	8.6	8.5	8.0	7.5	7.7	8.0	7.5	7.7	7.84
1960-61	8.5	8.6	8.6	8.4	8.01	8.1	8.9	8.5	8.4	8.75

Source: Percentages are computed from the data in the An Economic Appraisal: Tamil Nadu 1971 and Economic Survey 1970-71, Government of India.

as between different points of time and over different geographical areas and hence provides a measure of the ability or capacity of the State and the Country to generate income. It is this ability to generate income or the productive capacity of the State or Country and the changes in this index which are of decisive importance for growth. Judged by this indicator, the capacity to produce, Tamil Nadu's annual average growth from 1961-69 of 0.9 per cent, shows the need to develop rapidly the productivity of the economy. For this Table IV indicates the sectors where a special effort is called for.

6. This table shows a more or less contribution of the State to the National Income. The sector calling for additional investment and measures to improve productivity are agriculture and transport and communication. The Economic Times Research Bureau's computation in its issue of November 6, 1971 shows a similar trend. Based on current prices, it shows a 9 per cent fall in the State contribution to National income. Similarly the contribution of the agricultural sector to the State income has fallen faster than that of Industry and is contrary to the trends in Gujarat, Punjab and Haryana—the States with which Tamil Nadu's performance should be compared. Table II however constitutes a warning that computations based on current prices are misleading when comparing Tamil Nadu and All India or other State performance.

Growth policy and instruments :

7. Next it is important to examine the extent to which these trends in the total and per capita income of the State is within the policy determinants of the State. Such determinants must be expressed in multiple policy instruments. That at least is the lesson that we have learned from the first three Plans. To attain a certain rate of total and/or per capita income growth in the Country, in the first three Plans the main policy instrument used was industrialisation. The first plan of the State was largely an agricultural plan by default rather than by design. In fact for both the State and the Country, the only official policy declaration established for this period was the Industrial Policy Resolution. It was implicitly and explicitly assumed that with this single policy instrument, all other policy objectives—agricultural renovation, employment generation, population targets, price stability, reduction of poverty involving transfer of State resources to the 60 per cent poor majority would be attained. Even today there is some residue of this heritage, in the execution of the three grand objectives of the Fourth Plan —growth, stability and social justice. If bank nationalisation, monopoly control and industrial licensing are the policy instrument for securing social justice, there need to be separate instruments for securing the other policies. It is one of the elementary lessons of econometrics that multiple policy objectives cannot be attained by one single or a few policy instruments.

8. For Tamil Nadu's growth as measured by the indices set forth in Tables III and IV the policy instruments needed are :

(i) A production instrument divided into an industrial sub instrument an agricultural sub instrument and a communication sub instrument.

(ii) An employment instrument.

(iii) A prices and wages instrument.

(iv) A population instrument.

(v) A taxation and fiscal instrument.

9. The first instrument is largely outside the control of the State. Decisions as to location, scheduling, product mix and management for large industries are entirely outside the State's competence. The State's Fourth Plan is explicit on this limitation even at the time of its establishment: "It is not known what the allocation in the National Plan will be for development of large scale industry and mining, which is the special responsibility of the central sector". For small industries, the supply of industrial raw materials and foreign exchange needs are similarly decided outside. In agriculture, since the agricultural policy established in 1968, both the scientific and technological break through, their extension to the small, marginal, and dry farmer and the financial and other inputs for the new agricultural technology flow from decisions made outside the State. The communication policy in so far as railways, air transport and major highways are concerned is a central responsibility. The second instrument from the demand side falls only to a limited extent within the decision making frame of the State, while the supply side, particularly that of skilled manpower, is a part policy instrument within the State's competence. The prices and wages instrument again is outside the State's control except in a negative sense: the State can fashion and use an instrument to promote price and wage inflation. The fourth instrument is technically within the State's competence but is financially outside it. The fifth instrument is essentially outside the frame of the State—except for the sales tax and the agricultural income tax.

10. On top of all these limits, the financial credit and capital resource base for the State's growth is outside its decision making power. Not only must the growth strategy of the State flow from overall decisions made outside, but the major growth activities and the total resources available are decided outside the State. Little less than 1/3 of the total tax revenue, Rs. 74 crores out of Rs. 237 crores, about 1/4 of the non-tax revenue, Rs. 25 crores out of Rs. 105 crores and about 90 per cent of capital receipts, Rs. 592 crores out of Rs, 660 crores accrue to the State from outside of its revenue and capital raising authority. The opening plea of the State authorities in the document, Tamil Nadu: an Economic Appraisal 1971, speaks for itself: "Obtaining the lowest per capita devolution of central government assistance" ("the grant-in-aid" for 1971-72 was Rs. 6 per capita); and "If the pace of development that has been painstakingly generated and more painstakingly nurtured so far is to be sustained, the central government and the financing agencies should come forward in a big way to provide the wherewithal . . .". The use of the question begging terms, "assistance" "grant-in-aid" "wherewithal" are revelatory.

11. I have spoken so far as if we have five policy instruments, even though they are outside the control of the State. As of today, we have only one—the first. And we certainly have no strategy. A strategy is a consistent set of policies resulting in an orchestration of policy instruments. And further there is a divorce between the formulation outside of the State of even such policy instruments that we have the responsibility for operating the instruments which is wholly that of the State. My first triple conclusion is that there should be some relation between policy formation and execution: there should be separate policy instruments for each policy objective: there should be a conscious orchestration of these objectives and instruments.

Growth as a function of information exchange.

12. Until such time as the growth of the State can rest on this kind of a triple base, the growth of the State demands a system of information exchange and the solicitation and coordination of forecasts between the authority outside the State which decides on the growth determinants and the State authority responsible for packaging the information. Planning and programming for the growth for the State requires the communication of commodity-dimensioned packets expressed in price and quantity terms, covering all the relevant micro-economic production functions. These commodity dimensioned packages which are thus exchanged include (a) provisional output, institutional growth, and resource forecasts from the State, and (b) return flows from the deciding Centre as to suggested modifications in light of its overall priorities and pressures. This is an idealised picture of the process of Plan formulation in the State and at the Centre.

13. In actual fact the growth targets established in the State Fourth Plan is a function of a much simpler exchange of information. It is a function of transmission of data on desired quantities by the State and the return transmission of the prices/resources data by the Central authority. I admit that this is somewhat of a simplist caricature. On the State side there is a great deal of supplementary information provided besides quantities and on the side of the Central authority there is the usual armoury of inducements, controls and penalties, But the inadequacy of the information exchange base for Planning the State's growth is revealed in the gaps between the targets of the State's Plan documents and the achievements and the performance recorded in its annual economic appraisals. For one thing as noted in paragraph 9 and 10, without a firm resource base, the State's Plan document contains no real targets. It contains programmes of development to be undertaken with State resources and a justification of the extent to which resources from outside the State is needed to achieve the target growth of 5 to 6 per cent. The Fourth Five Year Plan document of the State is, in the third year of the Plan still a draft outline, with no known resource base. For another, even when there are sectoral targets, such as the target of 79 lakhs tonnes for food production their achievement cannot be ensured. Thus the brief review of the State's Third Plan performance in the Fourth Plan document concludes with the significant comment "Although in financial terms the Plan targets were over fulfilled, several of the vital physical targets of production and capacity were not achieved." The Third Plan target was Rs. 290 crores while the actual outlay Rs. 347 was crores. But there were large shortfalls in the attainment of the physical targets in the chemical industry, metal industry, food production etc., In the case of the food production shortfall, the non attainment of the forecast was not due to the usually alleged cause, namely, drought, but to the shortfall in attaining the fertilizer target. And so on.

14. This means that the State's growth desiderata require a communication system between the State and the controlling Centre which can make possible the attainment of a predetermined target degree of forecast accuracy. Both parties must exchange data on resources, quantities and constraints. The minimum information exchanged must relate to full sectoral and macro and micro economic forecasts. Unless there is this coordinated communication on planned forecasting, the State's growth base will not be established to attain any of the normal goals of growth planning, which include accuracy of forecasts, near optimum resource allocation by coordinating inputs and outputs, fairly full allowance for risks and uncertainties, resource transfers called for by equity criteria, and

stability through variation in the final outputs mix. The indicators of growth reported in the document—Tamil Nadu-An Economic Apparaisal 1970—cannot be tested either against a base established by the State as a result of coordinated communication with the controlling centre nor on the basis of quantified planning goals of the kind just referred to. My second conclusion is that in the absence of the first set of conditions as set forth in para 11 making State Planning possible, Growth Planning in the State requires full information exchanges and coordination to make forecasting (targets) accurate and performance adequate. This calls for a complete change in the scheduling, agenda, rules for the exchanges, and methodology of decision making leading to the Fifth Plan.

15. From this prolegomena, I now turn briefly to deal with some of the problems in the State's 1970 growth performance. In making such a problem oriented analysis, the generally satisfactory record of the State's performance in 1970 as set forth in the Appraisal Document is taken as given.

Agriculture :

16. The Agricultural sector is the dynamic sector contributing in 1970-71, 42 per cent of the total State product, employing 60.8 per cent of the working population of Tamil Nadu and contributes 30 per cent of the value added in the production process. The sector has a dual face—which can be variously described as modern and traditional, irrigated and rainfed, water based and drought prone. Depending on the classification adopted, the agricultural sector divides into 30-70, 40-60 and 35-65. 31 taluks in 8 districts—North Arcot, Dharmapuri, Salem, Coimbatore, Tiruchirapalli, Madurai, Ramanathapuram and Tirunelveli are the traditional, drought prone backward area. The constraints of the traditional sector are with regard to land use and water and those of the modern sector are those relating to the second generation problems of markets, storage and post harvest facilities and in the case of cash crops, improve high yielding seeds.

17. The 1970 Appraisal document reports a start for both sectors in developing the ground water potential through construction of wells. Against the Fourth Plan target of some 100,000 such constructions of various kinds, in 1970-71 over 14,000 new wells have been constructed. The traditional sector, however, still continues with a backward technology, low productivity, increasing underemployment of the major part of the agricultural labour force and contributes somewhere between 5-8 per cent of the value added in agriculture. In the modern sector, the second generation problems have yet to be dealt with. Here the major gain has been the improved agricultural facilities, including the High yielding variety seeds (37 lakh acres), increasing use of fertilizers (11 per cent) pesticides (4.5 per cent) and double and triple cropping patterns (5 per cent). As a result there has been an increased output of food grains of 22.6 per cent in 1970 over 1969 and an increase by 4 lakh tonnes over the rice production target. The production of cash crops also shows a 12 per cent increase in 1970 over 1969.

18. The dual phase of the State agricultural sector has been accentuated during the year. On the one hand there is the modern sector, largely in the irrigated areas, with high productivity, and an increasing capacity to absorb the new technology thrown up by agricultural research in the State and outside. The sector has increased its yields and is

ready to face the second generation problems. On the other hand there is the traditional subsistence sector largely oriented to dry farming making, intensive use of labour with low productivity, and for which the series of ad hoc, centrally sponsored schemes for the Small Farmer Development Agency, for marginal, dry and landless farmers and the pilot project at Koilpatti are being run.

19. A final comment. The production of inputs for the State's agriculture by its industry and the provision by agriculture of raw materials and industrial processing for the State's industry have not been subject to the kind of systems analysis which could provide an indicator for resource allocation and factor substitution and utilisation. My third conclusion is that the growth requirements in agriculture demand a special investment effort in the traditional sector, further research and credit flow into the second generation problems and the applications of systems analysis for establishing the inter relations between the States industry and agriculture.

Industry :

20. Industrially, the State again presents a dual face. There is the region which is growth generating and the region which is growth retarded. It is important to bear in mind that while the improved agricultural performance referred to earlier sustains and feeds the State's growth, it is only industrial development and progress that triggers growth. From the growth point of view therefore, the dual nature of the industrial sector of the State is somewhat serious. In the context of industrial location and industrial manpower, the growth generating areas in terms of districts and in priority order are : Coimbatore, Madras, Madurai, Tiruchirapalli, North Arcot, Chingleput and Thanjavur. The retarded districts are Ramanathapuram South Arcot, Kanyakumari, the Nilgiris and Dharmapuri.

21. Dharmapuri and Ramanathapuram which are the only two regions which fall into both the traditional agricultural sector and the backward industrial region call for a special strategy which has so far not been thought of or devised. The Fourth Plan document sets forth a special programme for the traditional agricultural sector in which these two districts are included. This proposed programme covers development of minor irrigation, wells construction, rural electrification (where only 50 per cent of the villages are electrified), energising of pump sets and land conservation. These are useful programmes and they should be executed on a priority basis-that is as priority over programmes in the modern sector. But what is needed for the two areas, Ramanathapuram and Dharmapuri which overlap in being agriculturally traditional and industrially retarded is an area development Plan for each along much broader lines than what is proposed in the Fourth Plan document. My fourth conclusion refers to our backward area. In these two districts, the area Plan must provide for (a) the execution of the agricultural development programmes referred to, (b) the identification of medium and small industries which can be immediately developed, and (c) the development of the infrastructure (particularly roads which are less than half per lakh of population compared to that in the growth generating districts), which such an agro-industrial development programme demands.

For the growth retarded areas generally, industrialisation projects should be devised around the location and development of ancillaries for the Salem Steel, Neyveli Lignite, Tuticorin Fertilisers as well as the Coimbatore Industrial complexes.

22. The State's industrial performance in 1970, as reported in Tamil Nadu—An Economic Appraisal 1970, shows (a) major concentration on nine important groups of products—hides and skins, power pumps, flour products, caustic soda, bicycles, cement, super phosphate, yarn and power transformers; (b) a high rate of growth in five groups—electrical and other machinery, rubber products, food products, mineral products, chemicals, (c) a declining or stagnant production profile in three groups, tobacco, textiles and transport equipment. In general, consumer goods which represent 60 per cent of total manufactures have done well, growing by 11.3 per cent (Sugar), 27.1 per cent (wheat products), 12 per cent (tea) 19.7 per cent (biscuits), 42.7 per cent (refined oil), and 10.2 per cent (vanaspathy). The intermediate goods—paints, refractories, textiles and rubber goods did moderately well in 1970 ranging from 1.5 per cent for tyres to 6.7 per cent for textiles for which 1969 was a bad year. It is in basic and capital goods production that the year registers a slackening or stagnation—caustic soda, super phosphates, cement, electricity generation, and capital goods generally, which came up against the serious shortfall in steel supply and production.

23. Small village and cottage industries continued in 1970 to develop on the basis of the investment in the third and three annual Plans, the Tamil Nadu Small Industries Organisation set up in 1956, and the twenty-six industrial estates including five in the cooperative sector and two in the private sector. The major cottage industry—handloom—registered a refreshing rate of increase of 6.87 per cent in 1969-70 over the previous year's stagnant record. The State's handloom products are an important export item to the markets in Asia, Africa, Europe and North America. In the small and cottage industry sector, which is both ancillary to large industry and in terms of consumer goods, employment and income potential represent an important growth generating instrument for the industrially retarded areas, there is need for a fresh programme and larger investments. Too much of the 1970 record is a function of past Plans and past investment. Future perspectives have to be explored now and the Tamil Nadu Small Industries Corporation established during the year must plan and invest in these perspectives.

24. The Tamil Nadu—An Economic Appraisal 1970 report has a serious gap. There is no separate appraisal of the performance of the private sector for that year. The Fourth Plan document stresses the importance of the private sector. It points out that, apart from agriculture, in many other fields, including medium and small industry, the investments of the private sector have a preponderant part in influencing the rate of growth. And yet the major economic appraisal report on the State does not report on the private sector performance. In the Annual Review of Industrial Development in Tamil Nadu 1970-71, by the Industries Department some information on this is available. During 1970, 36 licenses with a capital investment of Rs. 20.78 crores have been granted in the textile, food processing, chemical, hides and skin, paper, oil and machine parts industries. 16 per cent of the undertakings will be engaged in producing

new articles, 22 per cent represent substantial expansions and the rest normal renewal of activities. Some quality criteria is involved in the performance of the private sector during the year where letters of intent issued are concerned. Here, of the 26 letters involving a capital outlay of Rs. 30.69 crores, around 70 per cent represent new undertakings on production of new articles covering metals, chemicals, machinery, and transport equipment. Also during the year, 13 main industries have been registered in the State covering metal products, machinery, electrical and other machinery and goods. The nine foreign collaboration agreements registered by the firms in the State are not in every case needed in terms of the lack in the country of indigenous equipment or more particularly know-how. All this data does not, however, provide a basis for judging the performance of the private sector during the year and for this further information is needed based on such elements as installed and utilised capacity, debt-equity ratios capital-output ratios, labour-output ratios, employment trends, repair, maintenance and obscelance of machinery etc.

25. Two general comments on the industrial performance of the State can be made. First none of the data provided in the Economic Appraisal document nor in the Departmental Report makes possible a resource utilisation or cost effectiveness study. Given the parameters within which the growth framework of the State functions as referred to in paras 7 and 8, and given the lack of a resource base on which growth planning in the State can be undertaken, it is essential that the resources which are made available are used effectively, if not optimally. This requires performance budgeting and expenditure planning—for both plan and non-plan, and development and particularly non-development expenditures. The current reports read like the normal rationalisation and justification of the expenditures of resources that have been made available. I have a feeling that with the kind closed market that the economy has become, most of our manufactures do not have a cost base which is internationally competitive. It is time to turn to planning expenditures particularly in the industrial sector.

26. A second comment is the rapid expansion of consumer goods and intermediate industries in the State at the cost of basic and capital goods undertakings. The country's general policy in favour of important substitution and the State's non involvement in decisions concerning the number, tempo, and location of large basic and capital goods industries will drive the State's industrial activities further in this direction. In that case, the industrial activities might be concentrated a little more heavily on the production of wage goods for the rural and urban poor and lower middle class majority. My fifth conclusion is that this phase of the State's growth should be based on further resource utilisation studies and should be aimed at pushing forward the production of wage goods -- kerosine, coarse cloth, salt, sugar etc.

Employment :

27. The broad and depressing employment profile of the State is fully reported the Economic Appraisal report for 1970. The 1971 census establishes the labour for over 15 million, involving a 1.8 per cent decline compared to 1961, due to a change

census definition of a worker. This has depressed what is termed the State's crude economic activity rate from 45.6 per cent in 1961 to 36.7 per cent in 1971. It would be interesting to examine the incidence of this shift on the district rates—Salem, Tiruchirapalli and Coimbatore had the highest and Madras the lowest. 92 per cent of the work force is engaged in agriculture, self employment, and households and 8 per cent in the organised sector. The growth rate of employment in the organised sector for 1969-70 is 2.9 per cent. Within the organised sector, the work force which was divided 50 : 50 in 1961 between the public and private sector has, in 1970, shifted in favour of the public sector and now stands at 60 : 40. During the decade, employment in the public sector grew at an annual average rate of 4 per cent and in the private sector at 0.7 per cent. For the years 1969 and 1970 employment growth has been more even as between the two sectors—1.4 per cent and 2.9 per cent in the public and 2.4 per cent and 1.8 per cent in the private sector. The service sector increased its employment from 36.3 per cent of the work force in 1961 to 39.6 per cent in 1970, representing a more than 3.5 per cent increase. This sector which employs the largest number of nearly 600,000 workers and grows at the second fastest rate, has a depressing effect on productivity. It is significant that while 60 per cent of the public sector work force is employed in services and 8 per cent in manufacturing, in the private sector 16.7 per cent are employed in services and 55.3 per cent in manufacturing. As a counter weight, the highest average annual rate of employment growth (1961-70) is registered in manufacturing 15.3 per cent, in the public sector, while that for the private sector is 3 per cent in electricity, gas, water and sanitary services.

28. How does this picture of the employed work force in the State relate to the problems of unemployment, educated unemployment and under-employment. A sample survey in 1969-70 of 3959 rural and urban households covering 19,476 persons presents the following picture.

29. Figures in brackets are for the year 1960-61. In 1969-70, 45.4 per cent of the rural population and 29.1 per cent of the urban population (accounting for 38 9 per cent of the State population) are employed in gainful activities while 1.3 per cent of rural population and 2.3 per cent of urban population (i.e. 1.7 per cent of the State population) are unemployed. Both employment and unemployment (except in urban employment) have increased in 1970 vis a vis 1960. The unemployment growth rate has been higher. Sex-wise in rural and urban areas the incidence of unemployment among males is higher than for females. Areawise the incidence of unemployment in urban areas is higher than that for rural areas. Labour participation rates in 1970 have increased in the rural and declined in the urban area as compared to 1960. Around 60 per cent of the population forms the dependent sector.

30. The survey also throws some light on the profile of educated unemployment State.

TABLE V

EMPLOYMENT AND UNEMPLOYMENT IN TAMIL NADU

PERCENTAGE DISTRIBUTION OF POPULATION BY SEX AND LABOUR FORCE STATUS IN TAMIL NADU — 1960-61 & 1969-70.

Labour Force	*RURAL* *Male* *1960-1970*	*RURAL* *Female* *1960-1970*	*Total*	*URBAN* *Male* *1960-1970*	*URBAN* *Female* *1960-1970*	*Total*	*STATEWISE* *Male* *1970*	*STATEWISE* *Female* *1970*	*Total*
Employed	(54.23) 57.5	(25.92) 32.7	45.4	(50.17) 47.0	(11.30) 10.5	29.1	53.3	23.9	38.9
Unemployed	(1,44) 2.4	(1.8) 0.1	1.3	(1.86) 3.0	(0.4) 1.5	2.3	2.7	0.7	1.7
Total	(55.67) 59.9	(27.72) 32.8	46.7	(52.03) 50.0	(11.73) 12.0	31.4	56.0	23.6	40.6
Outside Labour Force	(44.07) 40.1	(71.82) 67.2	53.3	(47.1) 50.0	(86.58) 88.0	68.6	44.0	75.4	59.4
Total	100	100	100	100	100	100	100	100	100

Source : Tamil Nadu—An Economic Appraisal 1970.

TABLE—VI

PERCENTAGE DISTRIBUTION OF UNEMPLOYED PERSON BY EDUCATIONAL STANDARD—1970

	Unemployed			*Educational Standard*				
	Males	*Females*	Total	*Graduate and above*	*Matric*	*Below Matric*	*Illiterate*	**Total**
Rural	95.4	4.6	100	2.6	15.8	58.6	23.0	100
Urban	67.4	32.6	100	8.6	62.3	23.4	5.7	100
State	80.4	19.6	100	5.8	40.7	39.8	13.7	100

Source : Op. cit.

31. Among the unemployed in rural areas, 95.4 per cent are males and 4.6 per cent are females. Of these 2.6 per cent are graduates, 15.3 per cent matriculates, 58.6 per cent are literates below matric and the remaining 23.0 per cent are illiterates. In urban areas 67.4 per cent of the total unemployed persons are males and 32.6 per cent females. Of these 8.6 per cent are graduates, 62.3 per cent are matriculates, 23.4 per cent are literates below matric and the remaining 5.7 per cent are illiterates. Of the total unemployed, the matriculates occupy the highest percentage being 40.7 per cent. The incidence of unemployment among graduates in urban areas is higher than in rural areas.

32. The extent of under employment in the State has not yet been officially computed. In a sample study of some 1000 rural households in four districts undertaken by the Madras Institute of Development Studies, underemployment was defined as annual working time of less than 250 days in the year with 8 hours comprising a normal working day. On this basis it was found that 24 per cent of the total work force in the sample were underemployed.

33. A final statistical comment. The manpower balance sheet for the State upto 1981 shows that by 1971 over 46,20,000 employment opportunities have to be created. This rises to 78,29,000 by 1981. In place of the current 8,50,000 employed in manufacturing, 2.7 million must find such employment in 1974 and 4.3 million in 1981. In place of 4,40,000 in mining more than double the numbers must be so employed in 1981. In place of 72,90,000 employed in agriculture, 115 lakhs must be so employed.

34. My sixth conclusion is this. What this canvass shows is that there is urgent need for an employment policy for the State. Whether such a policy should be orchestrated with the growth policy or whether the growth policy should be a function of the employment policy is a major technical and political decision facing the people and government of Tamil Nadu.

Social Services.

35. *Education*: The Educational profile of the State is reported in the 1970 Economic Appraisal report and documents of the Education Department. This sector has been discussed in previous seminars and therefore can be treated summarily. In 1970-71 enrolment in primary education (age 6-11) increased by 2 per cent reaching 94.13 per cent, secondary (age 11-14) by 2.5 per cent reaching 55.10 per cent and higher secondary (age 14-17) by 0.5 per cent to 35.7 per cent and higher (age 17-23) by 13 per cent to 4.75 per cent, All indices, State budget, private expenditures, teachers trained, new institutions opened, show continuous expansion. This educational expansion has no relation to the rate at which the agricultural and industrial sector is growing as reviewed earlier. There is thus a double problem. First should there be a halt in educational expansion at the post-14 age level, as the present cost-benefit or cost effectiveness of the educational investment—private and social—is declining at a rapid rate? Why then are the government and parents engaging in this dysfunctional disinvestment? My own answer is that the educational demand is a cultural/social demand which has an economic illusion attached to it—that some day, somehow, somewhere, it will pay off. Disillusion on this count is waiting around the corner. There is a profound disillusion with the present educational system on the one hand, and an almost fatal fascination for it, leading to the constantly growing demand for the current product which is recognised to be of little value. This is against classical marginal theories—As utility diminishes, the demand for the product diminishes, other things being equal. In the State, other things, population pressure, alternative use of time and the structural factors make for increasing demand. The second issue is to embark on an educational reorientation which will meet the explicit and implicit hope of the people by relating educational stage directly to the skill requirements of Tamil Nadu over the next two decades. This would demand the disaggregation of educational stages and levels in order to equate them to the disaggregated skill requirements of the future Tamil Nadu economy. My seventh conclusion is:

educators, scientists and parents must now take in hand the unique opportunity presented by the readiness of the people for a profound change in the education system by moving to a more rational disaggregated education structure which can be locked in with the employment opportunities and skill demands of society.

36. *Health and Nutrition*: The Health and nutrition record in the 1970 Appraisal document shows a slow and steady improvement. For the year, the number of hospitals and training health centres increased by 6, beds by over 500, nurses by 100, the doctor population ratio stood at around 1 : 5000. Mortality rates have declined to 11.4 per mille and infant mortality to 62.5 per mille. If the nutritional requirements of the population computed according to the 1968 recommendations of the Indian Council of Medical Research are to be met, the following quantities of foods will be required in Tamil Nadu for one year.

	Requirement *Million tons*	**What is produced** *Total production in Tamil Nadu*
Cereals	5.8	6.9
Pulses	1.0	0.25
Green leafy vegetables	2.0	1.5
Other vegetables	1.0	1.2
Roots & Tubers	1.0	1.3
Fruits	0.5	0.2
Milk	3.0	2.0
Fats & oils	0.5	0.8
Sugar & jaggery	0.6	1.5

The position of Cereals, Fats and oils, Sugar and jaggery is satisfactory. Agricultural programmes should be directed to increase rapidly the production of pulses and legumes.

37. On the nutrition side, the situation is worsening. From the results of diet surveys of the Indian Council of Medical Research, the consumption of various foods in Tamil Nadu are established in the following manner :

Food Consumption in Tamil Nadu :

	Food consumption per day	*Recommended allowances*
	g.	g.
Cereals	368	475
Proteins	21	80
Leafy vegetables	12	125
Other vegetables + Roots and tubers	56	75
Fruits	6	100
Fats and oils	8	30
Sugar and jaggery	30	40
Milk and milk products	32	200

The consumption of all the food groups fall short of the recommended quantities. Consequently, the calorie intake is low at 1490 against the requirement of 2800, and protein intake at 38.7 g. against the needed 55 g. per day. But this average calorie and protein inadequacy is not the whole story. There is also the serious problem of distributive justice. A small minority have more than the needed calories and protein foods while the majority (around 70 per cent) have a much lower per capita consumption and suffer all the ill effects of under nutrition and malnutrition. My eighth conclusion is that the State's Agricultural programme should now concentrate on increased production of pulses, fruits and milk and the State must promote a distributive net work so that the major vulnerable section of the State's population have access to the foods they need and are entitled to.

38. *Family Planning*: The 1971 census shows an annual increase of 2.2 per cent of the State's population over the period 1961-71 compared to the annual increase of 1.1 per cent during 1951-61. The low and uneven per capita growth of the State recorded in Tables I and III traces in part to this factor of increasing numbers. The birth rate now stands at 31 per mille while the death rate has declined to 11.4 per mille. There is a considerable scope for further population expansion as the rate of infant mortality, which is 62.5 per mille, declines. It is against this rather serious background that the State target to reduce the birth rate to 25 per mille by the end of the seventies takes on urgency.

39. The family planning programme on which Rs. 4 crores last year and Rs. 5.6 crores this year are being expended for conventional contraceptives, various surgical operations, termination of pregnancies, inducements and a widely organised propaganda needs support and understanding. My experience in France over two decades and a half suggests that this annual expenditure of Rs. 4 to 6 crores on conventional and non-conventional contraceptives and propaganda in Tamil Nadu is not a necessary condition for arresting the growth of our population. The French government has a limited population without a family planning budget. It is also doubtful if such an expenditure is a sufficient condition for attaining our target of 25 per mille births by the end of the decade. It is not that the Rs. 4 to 6 crores of family planning expenditures are useless. Far from it. The State has a good record in reaching and surpassing the all India family planning targets. The government of the State is one of the few in the country which takes the programme seriously. The Minister of Health is personally heading a vigorous and successful compaign for the spread of, the programme. I was recently present at 3 centres in Thanjavur where its Collector has introduced a new and multiplying element by humanising the programme. Each man and woman undergoing a sterilization operation is kept in the centre for six days, given medical attention and special food and involved in recreation and cultural activities. (On the sixth day the stitches are removed). This ensures the complete safety and peoples acceptance of the programme. Intensive drives are currently underway in all districts in the State as the second round for this year. The issue for the economist is the factor prior to the start of the programme.

40. If there were prior conditions necessary and sufficient for limiting family size on the part of the poor 60 per cent of our families, then the facilities represented by the Rs. 4 to 6 crores will provide the means to carry out the family size decisions. Human resources analysts usually employ the cost benefit analysis to predict family size. That is, children are durable goods, which yield a stream of benefits which are offset against a stream of costs represented by their upbringing. If present values of benefits exceed that

of costs, births occur. In all growth models this factor is allowed for either as an endogenous element, leading to the low level equilibrium to trap, or as capital accumulation. Simply stated if the familyhead among the poor majority in the State believes that he can make himself better off by having a large family, he will have a large family. So the number of children in the poor rural family does not depend on the various birth control facilities available or not available to it, but on the fact that children are currently economic agents after age 8 and even more important, represent the only source of livelihood for the parents in their old age. For the poor family, there is no old age pension, no retirement provident fund, and no accumulated savings during the working life which could yield interest payments in old age. The only way for such parents to have access to consumption goods in their old age is by an inter-generational transfer. If on top of this socio-economic fact, the present health and nutrition pattern of the State makes for very high incidence of mortality of the first and second child, which an analysis of the 1961 census figures reveals, then the slogan for a family limited to two or three children calls for a much higher fertility rate.

41. My concluding conclusion is that the State's very good family planning efforts, requires as a necessary condition of its success means of ensuring the survival of the first child by an adequate health and nutritional programme; and as a sufficient condition some means of old age maintenance of the poor rural families through increased production and savings in the long-run and some kind of old age insurance programme during the current decade.

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In discussing the paper at the Seminar on Thursday, December 30, 1971 under the chairmanship of Mr. M. V. Arunachalam, Managing Director, Tube Investments, Madras the basic question about the validity of per capita growth as an adequate measure of the State's development status was raised. The rather serious discrepancy between the indices expressed in current prices and constant prices, suggests the need to use accounting techniques based on factor cost, market prices, and expenditure-income balance for computing State income.

The problem of employment, unemployment and underemployment is central to Tamil Nadu growth policy. Should this growth policy be a function of an over riding prioriy for the employment objective? This would mean lower priority for capital intensive, long gestation period Industry—power, steel, chemicals, fertilisers etc. and promotion of small and medium industry and IADP or HYU in agriculture. In research it would mean work on intermediate technology instead of modern sophisticated technology. On the other hand certain sectors of industry like computers, electronics etc. require for their development the most recent and sophisticated equipment. Equally it is possible to develop new areas of consumption to meet emergent and new needs such as in photography, city planning, motel and tourist industry, baby foods etc. To this it was suggested that the major problem before the State was to increase its productive capacity in order to meet the basic needs of the poor majority for food, clothing and housing. Any programme to create or meet new needs would run counter to such an imperative.

The educational consequences of the employment priority were discussed at length. The economic critique of the current educational system in the State as being a dysfunctional disinvestment, is widely accepted, but what are the alternatives to the existing system? Experiments to reorganise education within the existing College system which provide additional employment oriented courses were described. It was also suggested that the new institutions which are about to be started should be given a new skills and employment slant. Would such a slant be moving away from the humanities and liberal arts needs which Western educational systems are today adopting? As Tamil Nadu education is nowhere near that level of specialisation, its needs are in the direction of skills orientation. It was agreed that there was need for more precise information on graduate unemployment in Tamil Nadu. At bottom the problem is that the economy is not expanding fast enough to absorb the increasing number of graduates turned out by the Universities and Schools in the State. One suggestion is that there should be a halt in the further expansion of educational institutions. There should be a closer relationship between education, training and the economy. The IIT programme for training one hundred technicians attracted one thousand five hundred ITI graduates. Why are these well trained technicians in such large numbers without employment? Should the educational system be made functional to the agro-rural preponderance of the economy?

The employment objective also comes into conflict with the criteria of optimisation of resources. The huge losses suffered by Neyveli and the sick mills of Coimbatore can in part be traced to their over-labourisation. A policy of fuller utilization of capital was strongly urged. Such a policy is included in the industrial sub-instrument proposed in the paper but what would be the effect of such a policy on employment?

There is need for more attention to be given than is done in the paper to the demand elasticity for Tamil Nadu products whose major markets are outside the State. It is only in light of such a comprehensive analysis that a production programme for wage goods on the one hand and other consumer and intermediate goods on the other can be determined.

The central place of family planning in the State growth policy was emphasized. The State government led by the Chief Minister and the Health Minister are in the vanguard of making this policy effective. In fact the current thinking in the State that it is only anti-social elements which can be opposed to this programme which is a sine qua non for raising the levels of living of the poor majority.

Were the eight foreign collaboration agreements signed in 1970 essential for the State development? It was pointed out that at the time they were planned some years ago there were no alternative Indian equipment or know-how. There is also an element of Social laziness in continuing these arrangements to-day, similar to the preference by a person for a ready made house instead of planning the building of a new one. It was also agreed that there is lacking for Tamil Nadu a comprehensive assessment of the performance of the private sector. In this regard there are elements to be found in the company balance sheets, stock exchange reports and the annual publication by FICCI on the two hundred top firms. A special effort will be needed to fill this gap in Tamil Nadu which requires both finances and qualified personnel.

There was general agreement with the nine conclusions in the paper as an effective pointer for the future growth of Tamil Nadu.

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The Seminar started with a minute's silence to express its deep sense of sorrow on the demise of one of India's brilliant scientists—Dr. Vikram Sarabhai. His close Association with Tamil Nadu through Kalpakkam, his leadership of the country's nuclear programme, his advisory services to the United Nations and Unesco, and above all his warm human personality which many members of the Seminar had the privilege to enjoy and appreciate were recalled with poignancy. The thoughts of all members were with the sorrowing family.

A PLANNING MODEL FOR EDUCATION IN TAMIL NADU *

I

SOME GENERAL CONSIDERATIONS

Introduction :

The concept of educational planning has changed as a result of the experiences gained during the past fifteen years. Previously, it was unidirectional ; the process of planning started from the setting of objectives and reached the implementation stage, via designing of alternative strategies to reach the objectives. This educational process may be represented as follows :

Definition of objectives : → Design of strategies : } → Estimation of resource requirements and implementation.

The present process may be represented as follows :

→ Definition of objectives and priorities.
↓ Design of alternative strategies. } → { Evaluation of different strategies. ↑
↓ { Implementation of preferred strategies.
← { Evaluation of the performance of the system. } ← { Implementation of preferred strategies.
↓ → ↑

This change from unidirectional to iterative procedure has occurred primarily due to the growing recognition that the educational system has multiple objectives/which should be defined in a more precise manner; and they should be listed in an order of priority. The treatment of objectives in this fashion requires information about the extent to which various strategies can contribute to reaching these different objectives, about the resource requirements, implementation difficulties and side-effects of the strategies. The education system is simulated with alternative strategies designed to reach the vector of objectives, and the implications are studied. With the knowledge of the implications—reaching the targets, resource requirements, implementation difficulties —the decision maker may change the order of priority or choose the lowest cost strategy to reach the original order of priority. In this way a kind of feed-back mechanism could be introduced in the educational system.

The objectives of the Tamil Nadu educational system may be listed as:

1. Satisfying students' and parents' demand for education which is often called the "Social Demand" for education.
2. Producing qualified manpower needed for rapid economic development and balancing supply and need.

* A note submitted by Dr. Malcolm S. Adiseshiah, as Chairman to the Task Force Education, Science and Technology of the State Planning Commission.

3. Providing equality of educational opportunities.
4. Reducing income disparities, i.e., equal opportunity in post-school success.
5. Maximum development of individual ability and enabling the individual to lead a happy and adjusted life.
6. Other social, political, aesthetic objectives could be inferred from past experience.

These objectives are not listed in any order of priority. They are biased towards economic aspects. That does not mean other aspects of objectives are less important.

These objectives are inter-related as well as conflicating. There is an increasing demand for education in Tamil Nadu as well as in other parts of the country, amounting to an educational explosion. The Government is meeting this social demand by opening more schools and colleges and by reducing and/or abolishing tuition fees. It may be inferred from the Government's efforts, that objective (1) is one of the primary aims of educational policy in Tamil Nadu.

This objective (1) is in conflict with objective (2) namely, manpower requirements. As a result of the rapid expansion of the educational system, the supply of people with different levels and kinds of education is increasing and it is increasing at a faster rate than the capacity of the economy to absorb them. As a consequence, the State is faced with an army of unemployed people which poses a serious threat to the stability of the society.

The government aims, with liberal sprinkling of scholarship at providing equality of educational opportunity, particularly for scheduled castes and backward communities. The availabillty of scholarship and freeship acts as a fillip for an increased demand for education. Thus apparently objective (3) supplements objective (1). This congruance between (1) and (3) is more apparent than real. With the present system of financing education and with the help of the theory of human capital, it will not be difficult to demonstrate that equality of educational opportunity is not achieved. When all the children of the given age-group (say, primary school 6 to 11) are enrolled in school, there is equality of educational participation. Participation however is a crude measure of equality of educational opportunity. If the progress of students in the school and the achievement of students in different subjects are used as the measure of equality of opportunity, then it may be found that inequality still prevails. This is the experience in other countries where data is available. Thus with the present financial and organisational set up and with wide inequality in economic and social aspects of life, in the real sense of the concept of equal opportunity, there may be conflict between the objectives (1) and (3).

Objectives (1) and (5) will support each other, when the financial and cultural obstacles which play a role in the demand for education are removed.

Objective (4) — reducing income disparities — is broader than the others. Income is a function of many variables and education is only one factor. Even after reaching a stage when there is equality of educational distribution—both in quality and quantity — there may be unequal distribution of income. The objective (4) leads to some comments on the internal or micro objectives of education. What are the objectives of teaching

and learning? Is it mastery over the facts, information about the subjects like science, social science, language, etc., taught in the schools and colleges? Is it the development of personality traits like perseverance, suppression of aggression, deferred gratification, breadth of interest, independent self-reliance initiative, originality, independence of judgment, creative ability, curiosity, discipline, subordination, social leadership, etc.? Most people will accept both cognitive and personality development as objectives of teaching and learning. Which of these traits count more in achieving post-school success? We are completely ignorant about this problem. Studies are needed on the inter relation of educational production and income function. These two classes of studies will throw light on the role of education in the distribution of personal income. Available evidence, limited though it be makes one sceptical about the positive influence of education on reducing inequalities of income distribution.

This brief discussion of the objectives makes imperative a thorough study of education—goal—analysis both at macro and micro levels and the resulting priorities should be fixed. Without analysing goals, their inter-relationships, defining them in operational terms and fixing priorities, it is very difficult to have a scientifically worked out plan for education becomes difficult. The model builder can help in these matters.

MODEL

A model is usually defined as a theoretical description of certain aspects of a real—life process or system. The choice of characteristics taken into account and the degree of accuracy aimed at depend upon the type of problem for which the model has been designed. Education may be considered as an isolated one or it may be treated as related to other systems. In both cases the model describes the educational structure and its relationship—both internal and external—the structure consisting of a number of identified process which are connected by rules of movement which must be specified.

The real-life educational system consists of individual students, teachers, buildings, playgrounds, laboratory, library, equipment ranging from a piece of chalk to costly machines, inspectors, etc. These are elements in the real-life system of education. Their behaviour is familiar; a student can change his grade to the next one, remain in it or leave it; he may also change his school; the teacher continues in the same school or change the school, retires or leaves the system; he may be promoted. New buildings are built, old ones demolished, new schools and classes are added. Some schools are closed. The individual student's progress is determined by many factors; his natural ability, the socio-economic background of his family, his community environment, the quality of the education available to him and many others. In the same way teachers' efficiency is influenced by many factors. Thus we have innumerable details about education system. In practice it is impossible to include all the details in a model, and hence it is necessary to select some details, omit some, and aggregate the selected ones into groups. The result of this process is a model which is an aggregate simplified description of the structure and its relationships.

Different models can be constructed depending upon the aim of the study. If the interest is in education as a closed system (i.e., isolated from other systems), a model for the purpose can be built. If the interest is in an education system as a source of supply of educated labour force for other systems as well as for the education system, a model

with this view can be constructed; for example the econometric model of education. If the economic analysis of education (as well as economy) is the aim, a model using costs and benefits of education can be built. Manpower requirements and cost-benefit analysis may be combined as has been done by some model builders. The model can be broken into sub-model like student flow model, resource model, teacher supply model and balancing teacher supply and demand.

Simulation Operation Model SOM :

Simulation Operation Model is a tool for conditional prediction of the development of the educational system. It includes predictions about

(a) Stocks and flow of students and output;

(b) Resource requirement—physical and monetary;

(c) Supply of teachers in various categories, and

(d) Requirement of teachers and its balance with supply.

Estimates could be made for each year of the given period of time (i.e., simulation period). See Annexe I for estimating student flow.

In the first meeting of the Task Force on Education, it was generally felt that education system should be linked directly with the economy, that levels of education should be equated with the levels of skills demanded. Is it possible to construct a model and an SOM on the premise that the right to education is directly equated with the right to employment. This SOM is neutral with regard to priorities between educational objectives; it merely simulates the development of the system on the basis of various assumptions such as demographic change, transition co-efficient, restricted entry-practice, relationship between physical and financial resources, teacher-pupil ratio, class size, etc. It is thus a kind of "what-if" model. It can be used as a forward running model in the case of "social demand objective" of education or "backward running" model in the case of "manpower requirement objective."

General Assumption of SOM :

(a) The educational system consists of a number of educational 'Boxes'. A box is a grade consisting of a number of classes; resource requirements, transition co-efficients are specified for each box. Different boxes can be distinguished.

(b) The educational system is divided into a number of levels and types.

(c) Possibilities for students.

   (i) repeat the same grade,

   (ii) drop-out without examination,

   (iii) leave the school with examination,

   (iv) continue to next higher box or branch out to another type of box,

(d) Certain units have restricted entry; number of places available are expressed priori for every year.

A. Flow Sub-Model :

This sub-model calculates from year to year the student stock in the educational system and the outflow from it. The stock can be calculated for each box and level and types of education. The calculation is based on the existing stock in each grade, the transition co-efficient, the number of available places in restricted branches, demographic data, etc. A high degree of disaggregation is possible. Within a box, students may be classified by sex, by location like rural and urban, by socio-economic status of their parents. The power of the computer available is the practical limit to such disaggregation.

The demographic data, transition co-efficients, places in the restricted branches are given as inputs in the model. They are pre-determined. The flexibility of the model may be illustrated with an example. Suppose the objective is to reduce the drop-out rate in a given grade, i.e., improve the transition co-efficient. The model will work out the implication of the improvement in transition co-efficient to certain percentage. In the same way, it can treat a reduction or increase in the population aged 5-6 which is the school entry age. The model does not say anything about how to reduce the drop-out and increase the transition co-efficient. Such problems should be worked outside the model. The input-output analysis at micro level (individual school level) will indicate the policy requirements necessary to improve the efficiency of schooling. If the relationship between resource input and student progress, the knowledge could be used as input into the SOM and implications could be estimated for the whole system.

B. Resource sub-model :

The resource sub-model is supplementary to the overall-educational model. It accepts as inputs pupil stocks, school curriculum, information on resource used and certain policy variables. It calculates for each education box resource requirements and expenditures—current and capital. The technique of programme budgeting is used in these calculations. Suppose the policy maker wishes to improve the achievements in different subjects at the end of say, the fifth year of primary education, Micro analysis will indicate the policy to be pursued to achieve this objective. This data could be used as an input into SOM resource model and total resource requirement could be computed.

The model can also calculate, the required teachers and supply of teachers, given the teacher/pupil ratio, teaching load, subject qualifications, and training class size, number of specialisation, etc.

Throughout the operation there are many inputs into the model. These inputs are predetermined. The validity of the model as a correct and reliable predictor depends upon the validity of the input data. For example, transition co-efficients observed during the recent past may be used (in fact they are used in many models). But there is no guarantee that the co-efficients will remain constant. There is no dependent demand function for education, from the social as well as individual's demand point of view. In the same manner if the manpower planner gives the manpower requirements, the educational system can be planned. The manpower approach to educational planning uses the following steps in the process of calculation: The total GNP and its sectoral distributions are projected upto the target year. Using the labour productivity trend, the total number of labour force required to achieve the given target in each sector is estimated. The labour force in each sector is distributed into occupational divisions from which educational

requirements are estimated. From the base year stock, death and retirement, emigration and immigration, the additional requirement of manpower with different educational background is estimated. The SOM could be "run backward" to plan education. The experience of the countries where manpower approach has been used to plan education, and international comparative analysis of education, occupation and economic development throws some serious doubts about the approach.* Todate there is no reliable understanding about the economy's demand for qualified manpower and the inter-relationship between supply of educated persons and the demand for them. There should be further research into (a) the economy's demand for qualified manpower, (b) the individual's demand for education and (c) the process of adjustment between the educational system and economic system. In the process of analysing the flexibility and mutual adjustment of the two systems, educational finance and wages and salary structure should find an important place.

II

Education in Tamil Nadu

The structure of education in Tamil Nadu is given in a schematic form in Annexe II. On the basis of levels, the whole system has been divided into.

(a) School education and

(b) Collegiate and University education.

At the school level there are three stages: (a) primary which has five years of education, followed by the middle school, having three years of education, followed by high school the duration of which is three years. A child who has completed his fifth anniversary enters the primary school. At the end of the middle school, i.e., 8 years of study, he has options: he may choose the high school, or technical high schools or technical training institutions. A great bulk of the students prefer to go on to normal high school. At the end of high school, on successfully completing the public examination, he may enter Pre-University Course or polytechnique or the teacher training schools which train teachers for elementary schools in the employment market. Among those who continue their education the majority go to the Pre-University Course and after Pre-University Course, they have many further options, general education in Arts and Science or professional education engineering, medical, agricultural, veterinary, etc, The government follows an open-door policy in general education, but rations the places available in the professional colleges. There is also ample scope for going on for Masters Degree in all branches after the first degree.

Compulsory primary education free of cost to individuals has been accepted in principle and the government is implementing the principle. But so far, consderable proportion of the children are either not going to school or dropping out of schools before completing the compulsory stage. In the State education up to and including the Pre-Universiiy level is free of all tuition costs to students and parents. At every stage of the whole system, there are heavy drop-outs who join the labour market.

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* See my paper to the Seminar of Institute of Applied Manpower Research/OECD on Manpower Methodology.

III

A DRAFT FUTURE MODEL

Assumptions of the Model.

1. Skills required in the labour market are given for the future. The skills are classified by type and level. There is the possibility of ascending in the level of a given type of skill and in some cases there is possibility of moving from one to another type of skill. This can be shown in a matrix form (annexure III). This matrix of skill and the change in the matrix over a period of time could be used to plan education.

2. The democratic structure of the society is assumed. Students or the parents have the freedom to choose the type of education and the level they desire. Each person has the freedom to acquire education throughout.

3. The school-entering age is reduced to three plus. This has at least two advantages: (a) At the present stage, children are economic agents at the age of seven or eight. They can earn some money at this age. Because of this earning capacity, there is a large drop-out from the school. There are also other reasons for drop-outs. By organising general basic education for the age 3-8, the drop-out problem could be considerably reduced. (b) Those who are not participating, at present, in primary education and those who are dropping out before completing the primary cycle, come from the poor families where the parents are illiterate, and the family milieu is not conducive to education. By bringing the children at the younger age into school, the lack of appropriate family milieu is to an extent compensated.

4. The distinction between general education, professional education, training, work experience will not be water-tight as it is today. The distinction will be to a great extent blurred. The shop-floor in the school could be replaced by the training programmes in the farm and factory. The false distinction between school education and out-of-school training can be dropped and the two merged in a single educational system, where one part provides general skills and the other part specialised professional skills. Educational signals will take a count of the complete cycle. This is advantageous also from the point of view of the equity principle. At present income foregone by the students forms a considerable part of the cost of education, borne by the student. As a result many from the poor families do not continne their education. By blurring the distinction, the student may leave the school, enter the labour market and still continue his education with a view to better his career. More and better chances will thus be provided for a life-long education. From the economic point of view also it is desirable. Due to new invention, technology is changing and as a result, certain skills are becoming obsolete before the persons possessing these skills "retire". Continuing education and retraining will postpone the "retirement".

5. A group of experts consisting of curriculum specialists, job analysts, examination reformers could work out the curriculum reform, methods of teaching and evaluation techniques at different levels and types of education and training to suit this changed philosophy of education and student mix.

6. Education and training and on-the-job experience are complementary and not substitutes. Existing evidence suggests that better educated people tend to receive a disproportionate share of on-the-job training provided by the industry. This emphasises the importance for industry of people with general education instead of specific vocational preparation and that the need for technical institutions merging their training programmes with the industry concerned.

Description of the model :

All the children enter the basic school at age three plus and progress through it for five years. Many complete the cycle in five years, some take more than five years. Basic education here means, education which is the basis or foundation for further education or for employment in life. Language, arithmetic, social habits are emphasised. The immediate environment is used as media for imparting such basic education. Education at this stage serves to prepare the pupils (a) to get on-the-job training, later in life. (b) to go on to higher levels of education and (c) to have a common educational experience.

At the end of five-year basic education, a portion of the completers (say 50 per cent) join the labour force as they do today by dropping out of Class-I and II. They have special continuing education programmes and on-the-job training before entering the actual labour market. That is while they are working, they have of continuing study and train to further their career prospects. Another portion of them go on to general education, while the rest choose various professional education lines. — See Annexe IV.

The general education channel as well as the various professional educational channels are arranged in hierarchy. Successful completion of one cycle or course is necessary to proceed to the next one, After completing any cycle in the general education, the student can branch off to a professional channel or enter the employment market and join the education stream at an appropriate level. Educational admission will be on the basis of assessments and entrance tests, while for employment purposes the educational back ground will be separately evaluted and channelled into training.

In all the channels, general and professional, basic principles, concepts, theories are emphasised. The curricula, methods of teaching are such that the graduates at the end of a cycle in a channel are not immediately employable. They have a strong educational basis. They are given training on-the-job. The period of on-the-job training may vary depending upon the skills and abilities expected of the persons and the preparation of the person on the completion of the cycle. The higher the level of education, the larger may be the period of on-the-job training. The educational certificates and signals will cover both school and out of school training requirements.

The persons in the labour market will have every opportunity to study in the evening schools and colleges, correspondence course, radio and T. V. Schools etc. There is no need for separate institutions for the continuing education. Schools and colleges might be utilised for continuing education ensuring fuller use of the institutions (e.g., for 18 hours instead of the present 6 hours). There will be comprehensive programmes of testing and identifying talent as part of guidance services.

When equality of opportunity is achieved in practice, students from all socio-economic backgrounds will be going to schooling. By equality of opportunity is meant a random relationship between achievement in schooling and the socio-economic background of the family. As student mix is changing, traditional curricula and methods of teaching will be changed to suit the changed mix of the student and changing social and economic needs of society. There will be pedagogical change along with organisational change. The structure of education, both organisational and pedagogical will be designed to promote diversity flexibility and further development.

A Summing up :

The model proposed has thus 9 features which may be summed up as follows :

1. The present functions of Tamil Nadu Education-the development of the personality of the child, the understanding of the culture and history of the State, the country and the world, the instruction in the moral and spiritual values of the country, the acquiring of technical and professional skills, the meeting of the growing demand for education and the social compensation for the condition of the poor majority of the State's population-will be continued. In addition, the major new aim of the educational system in the next twelve years will be to relate directly the right to education with the right to employment in the State to relate the various stages of the educational and training system to the skill demands of Tamil Nadu.

2. School education will be of ten (10) years duration. These ten years will be broken into five stages, viz. years 1-3, 4-5, 6-7, 8-9 and 10. Each stage will correspond with the general education required for an appropriate skill-level in society. At the end of each stage, students who leave the school-stream, will be provided educational facilities so that the constitutional requirement of education up to the age of 14 years as well as education and training as a continuing life-long facility are met.

3. The entire school system from class-I to X will be functional. The curriculum of rural schools will be grounded in the rural environment and those of the urban schools in the urban environment.

4. From Class-VII, there will be streaming into various educational specialisations and students who leave school after that stage will be provided on-the-job training in farm, factory and office which will be part of the educational certificates awarded to them.

5. Classes-IX and X will be so designed as to be terminating periods for the majority of students and as entrance to higher education for those who are by merit able to continue higher education.

6. Out-of-school education and training will be provided both to students who have left the school system to adults, illiterate, semi-literate, literate. The programmes will be in both general education and vocational and professional training and educational diplomas will be established to certify these programmes.

7. Higher education will comprise two years of pre-university education followed by two years of under-graduate education training. After the pre-university course, the student will be admitted to general science and arts colleges or professional colleges-technical, agricultural, medical and veterinary. In professional education there will be two or three levels of training and degrees. All professional education and training will be integrated with their professions as is the case with medical education. After leaving college or for those who have not entered college, further educational and training programmes will be organised to enable them to pursue higher education. At all levels of school and higher education, educational mobility will be assured in relation to employment needs and demands.

8. Science Research will be a major responsibility of the State supplemented by resources from the private sector. Research programmes in the universities and research institutions will be supervised by a State Research Council which will receive and disburse research grants. The supervision and co-ordination of research will be effected by the State Science Academy.

9. The financing of education of the State will be limited to

(a) the first five years of schooling ;

(b) science and craft education and training after Class-V ;

(c) out of school education and training at all levels ;

(d) quality institutions at the general collegiate level and all professional institutions at various levels ;

(e) science research in universities and research institutions, and

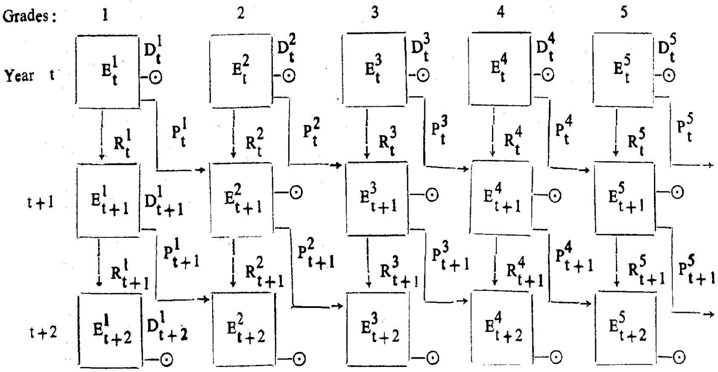
(f) scholarships for students from the disadvantaged sections of society and those with merit and talent.

* * * * * *

ANNEXE I

METHOD OF ESTIMATING THE STUDENT FLOW

For illustrative purpose 5-year primary education is taken here.



Let E_t^i be the number of pupils enrolled in grade i at year t.

R_t^i be the number of pupils who repeat the grade i at the end of the year t,

P_t^i be the number of pupils promoted to next higher grade at the end of the school year t.

D_t^i be the number of pupils who drop out from grade i including the deaths and emigrants. We assume in the calculation that there are no immigrants; this assumption could be easily omitted.

N_t^i be the number of first enrolment in the first grade at the beginning of the school year t. Then

$$S_t^1 = R_t^1 + P_t^1 + D_t^1$$

Repetition rate $r_t^i = R_t^i / S_t^i$

Promotion or transition rate : $p_t^i = P_t^i / S_t^i$

Drop-out rate : $d_t^i = D_t^i / S_t^i$

$$r_t^i + p_t^i + d_t^i = 1$$

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$$S^1_{t+1} = r^1_t \; S^1_t + N^1_{t+1}$$

$$S^i_{t+1} = r^i_t \; S^i_t + p^{i-1}_t \; S^{i-1}_t \quad (i = 2, 3, 4 \ldots\ldots)$$

r^i_t, p^i, d^i, could be easily calculated from the recent past and these could be treated as constant or as changing.

Even when there are more than one option at the end of a given grade, say Pre-University, the method could be used.

P.U.C. Class. → Labour market,
→ General Education,
→ Engineering Education,
→ Medical,
→ Agricultural, etc.

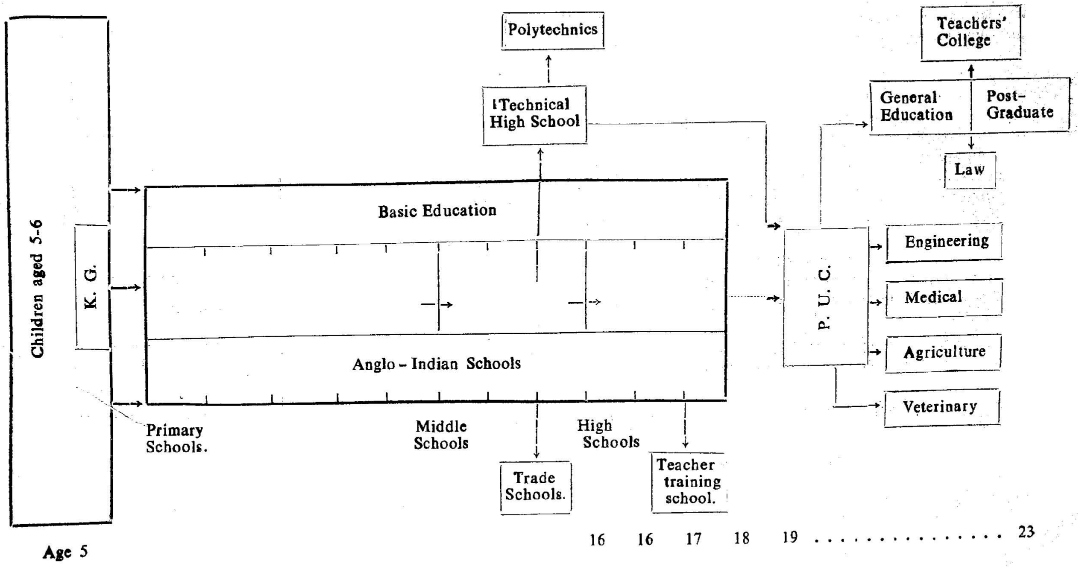
From the past data on the P.U.C. pass and class division of the pass, the proportion of those going to different types of education could be worked out.

This method might be expressed in matrix notation which is easy for manipulation. The Robbins Committee Report on Higher Education in U.K. is a classic example of this method from the " Social demand for education " point of view.

It is however necessary to note a major limitation in this whole calculation. In the existing studies, in the last analysis, enrolment is treated as a function of time. There has been no analysis of " demand function " for education. As a consequence the results of calculations were found far removed from the actual achievement after 4—6 years of experience. The Robbins estimated figure was found 15 per cent less than the actual achievement in a period of five years (1962—'67) in the field of higher education, and 25% less in the field of qualified school leavers for the same period.

ANNEXE II

PRESENT EDUCATIONAL SYSTEM — A SCHEMATIC PRESENTATION.



SKILL MATRIX

Skill Type (columns) / **Skill Level** (rows)

	1	2	3	N	
1	(X) → ↓				
2	(X) → ↓				
M					

ANNEXE III

Job analysis — List of duties involved in the job.

Job Specification — List of abilities required of the person who is to perform the job successfully.

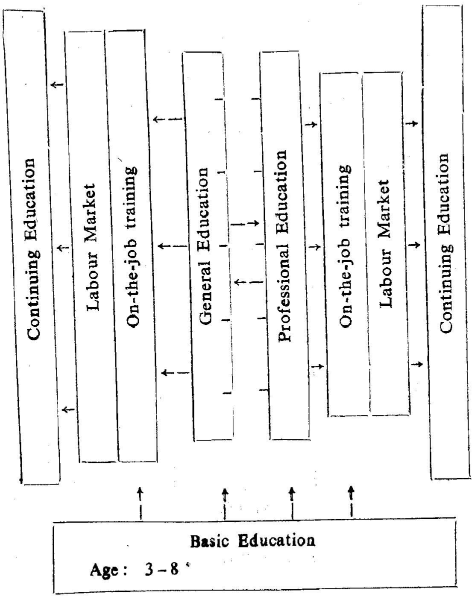
Job Evaluation — The process of determining the worth of the job in relation to another without regard to personalities.

At lower levels, it is relatively easy to make a job analysis, but it is difficult at higher levels. (e.g.) An *executive* is defined in ten dimensions :— providing staff supervision in non-operational areas, supervision of work, internal business control, technical aspects of production, and markets, human community and social affairs, long-range planning, exercise of broad authority, business reputation, personal demands, preservation of assets.

"There is no direct relationship between performance in school or training programmes and records of success in management". (By J. Sterling Livingston in "Myth of the Well-Educated Manager". Harvard Business Review, January-February, 1971).

ANNEXE IV

A DRAFT FUTURE MODEL



There is more than one professional education branch. There is one over all common labour market. If it is on one side only, the arrows will make the scheme not clear. To avoid misunderstanding labour market is put on both sides. Continuing education will take place in the general and professional educational institutions.

CORRESPONDENCE

Dear Prof. Kurien,

I have gone through your article on Research Methodology in Economics written by you and published in the Monthly Bulletin, July 1971 issued by the Madras Institute of Development Studies. You have reviewed very nicely, the programmes and problems which have been dealt at Madras Workshop.

May I invite your kind attention to the first para at page No. 78 under the heading "Economic Research in South-Indian Universities", wherein you have remarked that :

"In South-Indian Universities Research is appallingly low, the South-Indian tradition in Economics in the empirical tradition of village studies, our Research workers appear to be hewers of wood and drawers of water, even a casual look at the research topics of the participants of workshop will reveal how very conventional and worn out the areas of work, consequently there is little intellectual excitement about research and research topics".

I have the honour to bring to your kind notice that you may be correct regarding the view expressed above so far as the South-Indian Universities used to be concerned. But this is slowly and hopefully changing. There are many places where this regeneration is taking place. But in particular I may mention Osmania University where this is being systematically undertaken. Less and less are our research topics based on collecting data without reference to policy framework.

If there are empirical village studies they are directed towards filling the gaps of our knowledge relevant to choice of an optimum long-term strategy of development.

For example, one may refer to the topic, "Long-term educational Planning for India" which Mr. H. Venkateshwar Rao of this University who was one of the participants in the Summer Workshop has chosen. This topic not only possess the nature of the macro-approach but it is quite new in the area of research, as education is taken therein to be investment for economic development. Can we say this topic as conventional and worn out? In the same way one may also look at my topic which is 'Fiscal Policy for Planned Development'. Though the research on Fiscal Policy may not be new, yet the context that has been taken is of different nature. It is known full well that different types of situation demands different types of research orientation. The fiscal policy for planned development is of quite a new nature. Thus this topic neither comes under the empirical tradition of village studies nor conventional and worn out area of work.

One may also refer to the topic of Mr. K. Seshagiri Rao on the role of H-conserving industries. This topic is quite new, and research on such topic is inevitable, in the context of the stress on the Heavy Investment Strategy. Since the policy of the government is rapid industrialisation in the country, his study reveals where we are using output of Heavy Investment Sector (H) in the consumer-goods industry, so that H-output will be conserved which will enable us to reach in the least time the destination (which is taken as the Robinsonian concept of the Golden Age which will result in provision of full employment and full utilization of technology with highest standard of living allowed by the constraints). Can we say that the topic is of empirical tradition of village studies and worn out areas of work?

This is sufficient to indicate that there is an attempt at Osmania University not to follow the topics of data collection to make compendium of material without reference to a framework designed to be used for policy purposes, nor to select worn out areas of research work without giving them a new life and orientation. The type of Summer workshop which, you kindly organised is the vehicle for the diffusion of change among scholars through interaction.

Osmania University, (Sd.) M. NARASIMHULU

Hyderabad.

20th October, 1971.

Dear Mr. Narasimhulu,

Thank you for your letter of 17th December and the copy of your letter to me dated 20th October.

I agree with the substance of your comments that in Osmania University under the leadership of Prof. Mathur you have been making a major effort to give a new orientation to research in economics. I have acknowledged it publicly during the Workshop and have also expressed the appreciation of the work that each one of you have been doing in our conversations. But when it came to writing of the Report I had to make a choice between commenting on the work going on in each one of the South Indian Universities or of making some general statements. I decided upon the latter and you will notice that in that Report there is no reference to any particular university. I had to reflect on the general situation in South India, and I presume you will agree with me that what I have said is right.

Madras Christian College (Sd.) C. T. KURIEN

Tambaram.

22nd December, 1971.

Regd. No. M. 8831

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